

First Users Pleased With Intel Swap for IBM CPUs

By Nancy French
And Ronald A. Frank
CW Staff

First users of the Intel Corp. Advanced Systems (AS) series mainframes have experienced few if any problems in replacing their IBM 370 systems, a *Computerworld* survey has found.

In all cases, the Intel mainframes were swapped for their IBM counterparts with minimal effort and the IBM operating software was totally transparent to the AS machines, users said.

Most AS users experienced throughput improvements that confirmed initial estimates and some said the Intel CPUs exceeded original projections.

Dr. Clair Maple, director of Iowa State University's Computation Center, swapped his 2M-byte IBM 370/158 for an AS/5 on May 13 in one of the smoothest conversions he said he's ever seen — "We simply unloaded the 158 and loaded up the AS/5 and kept right on running."

As for the AS/5's performance, "it's the same machine — it's completely equivalent

to the IBM 370/158.

"Statistically it's showing up a little better, but I suspect some statistical aberrations are responsible for that — not anything real," he said.

The Computation Center has an unusually large scientific and research workload because the Energy Research and Development Administration Ames Laboratory is located on the Iowa campus. To handle that load, its 158 had been running as a dual system with an IBM 360/65.

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COMPUTERWORLD

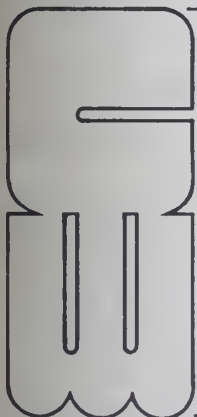
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Washington Round-Up

By Edith Holmes, CW Staff

Wiretapping 'Text' Found

WASHINGTON, D.C. — The "in thing" during the Nixon Administration, wiretapping has made a comeback in the form of a federally funded study released here recently by a congressman who is investigating the illegal use of the technique and its resulting privacy invasions.

The study provides a "how-to" lesson in the interception of a suburban residential phone, a business' data communications to a computer service and conversations over the direct dialing network between two individuals in different cities.

The document, obtained and publicized by Rep. John E. Moss (D-Calif.), is "a previously unrevealed third volume of a little

(Continued on Page 4)

HEW Probe Continues

WASHINGTON, D.C. — A \$38,300-a-year federal computer project manager has been dismissed by the Department of Health, Education and Welfare (HEW) for allegedly accepting more than \$3,000 in meals and trips from a company whose \$7.5 million HEW contract he managed.

Edwin B. Parker III, project manager of the HEW Office of Education's automated student loan management system, allegedly received the gratuities and favors from On-Line Systems, Inc., a Pittsburgh-based firm, [CW, July 18].

In the dismissal notice sent to Parker a week ago, HEW stated he would be asked to leave in 30 days in part because he also

(Continued on Page 4)

SSA System Security Hit

WASHINGTON, D.C. — The Social Security Administration's (SSA) communications system that accesses personal information on millions of Americans is open to fraud and unauthorized disclosure of confidential data, according to a government audit recently made public by two members of Congress.

Security procedures and controls for the SSA Data Acquisition and Response System (SSADARS) are "not adequate to prevent fraud and abuse or assure compliance with the requirements of the Privacy Act of 1974," the report by the audit agency of the Department of Health, Education and Welfare

(Continued on Page 4)

Programmer Productivity Rising Too Slowly: Tanaka

By Nancy French
CW Staff

TORONTO — If the rate of programmer productivity improvement remains at its current 3% per year, by 1985 automated information processing could be the most labor-intensive of all industries with the possible exception of agriculture.

This gloomy prospect was presented in a speech prepared by Dr. Richard I. Tanaka, president of the International Federation for Information Processing (Ifip), as his keynote address for the triennial Ifip Congress 77 which began here today.

In contrast to software costs, the price/performance ratio of hardware has improved by a factor of 100 each decade since 1955 and indications are that this will continue for at least the next decade, Tanaka said.

If these rates do not change, by 1985 90% or more of the costs of data processing will be spent on training and support of the people associated with the equipment rather than on the equipment itself, he warned.

But there will be changes. Developments already on the horizon, which had their beginning with semiconductor technology, will have an important impact on this equation, the international marketing and management consultant indicated.

Microprocessors and stand-alone systems on one hand and distributed processing systems on the other will affect the software problems now faced.

Microprocessors will be substituted to perform software

functions. Portions of large mainframe operating systems could eventually be handled by "subsets of dedicated hardware processors," he said.

Fewer Specialists

As software becomes translated into hardware, the functions available will become standardized to a certain extent, Tanaka forecasted. Some may see this as a limitation, but it will help create "a stabilized set of tools with which to solve problems."

Ultimately this will make computers easier to use and more accessible, both physically and functionally, to users who need not be computer specialists, he said.

This accessibility will expand the use of systems that perform computations at

levels previously considered practical only in large installations. The proliferation of small commercial and business systems is one indication of what changes in economics can do, the former California Computer Products, Inc. senior executive said.

A second aspect of accessibility is in distributed processing, using terminals with varying degrees of computer capability interconnected by a communications system. With satellite systems and improvements in other transmissions, communications are becoming relatively independent of distance, he said.

Distributed processing has specific international implications, Tanaka pointed out. There are clear advantages to

(Continued on Page 6)

3033 Delivery Dates Set

ARMONK, N.Y. — While the industry remains in the dark about delivery dates for the IBM 3033, the mainframer has begun enlightening eventual systems recipients.

Specific dates recently went out in a series of letters to customers, according to an IBM spokesman who would only tell *Computerworld* that deliveries will begin in the first quarter of 1978.

Positions in the delivery schedule were determined by taking all orders received during the "first-day order" timeframe and then randomizing and sequencing them in a "fair and

equitable fashion," he said.

After the "first day order" period, deliveries were strictly on a first come-first serve basis, he added.

In acknowledging the 3033 orders, IBM required each customer to complete a certification form stating he intends to use the system himself or retain ownership. Prospects were also subject to a preliminary credit check, the spokesman said. These measures were instituted to curb speculative orders.

IBM would not disclose how many letters of intent it had received nor the number of delivery dates it has set.



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For Medicaid System

Board Checking Mass. Bid Award

By Don Leavitt

CW Staff

BOSTON — "We've been had. We'd like to see this procurement thrown out and the whole process reopened," the first witness told a review board convened at the State House here late last month to study how the Commonwealth of Massachusetts selected the winning proposal for its Medicaid claims system.

The proposal submitted by Blue Cross of Massachusetts with a subcontract to Electronic Data Systems, Inc. (EDS) of Dallas was selected, but contracts have not yet been signed. The procurement has been challenged since two members of the selection committee have outside business with EDS [CW, Aug. 1].

D. Reid Weedon, senior vice-president of Arthur D. Little, Inc. (ADL), told the review board he was "stunned" by the situation. His company's bid was rejected as nonresponsive, but the challenges could have been "easily cleared up" if the state had met with ADL — "as we asked it to" — to review the apparent deficiencies before the rejection.

The situation was especially surprising, he said, since just weeks before the rejection the state had asked for

more time to consider the bids because the selection board wanted to ask several of the bidders some questions. ADL wasn't listed to face questions, so "we were optimistic," Weedon remarked.

The rejection could cost the state as much as \$5 million extra over the course of the three-year contract. That, according to Weedon, is the difference between the ADL bid and the \$19.5 million proposal from Blue Cross.

Cobol vs. BAL

The three-man review board was organized to determine if the rejections of proposals from ADL and from Citibank were unjustified and discriminatory. Made up of one person from the state's Department of Human Services and two members of the Governor's Advisory Committee on Computers and Data Processing, the board is also supposed to resolve "the Cobol issue."

Most of the bidders said they would write their programs in ANS Cobol since that is specified in the request for proposal (RFP). Blue Cross indicated, however, it will work in BAL with the understanding that it would convert the programs to Cobol whenever they

have to be turned over to the state.

Weedon agreed that compliance with the call for Cobol is a "must." He assured Charles Zraket, a vice-president of Mitre Corp. and member of the review board, that ADL would do all of its programming on this project in Cobol.

The reasons the state gave for rejecting the ADL proposal were "technical trivialities," he told Human Services assistant secretary Charles C. Stover, another member of the board. Each bidder was required, for example, to accept the general terms and conditions of the RFP. But whenever ADL attempted to detail its assumptions or to stipulate its intentions to comply — as the RFP provided — the proposal was deemed to be nonresponsive, he said.

ADL failed to include in the technical portion of its proposal a statement accepting the penalty clause condition in the event of missed deadlines. But, Weedon noted, that statement was in the cost portion of the proposal — which the state never opened.

That's where the RFP said the statement should be, he said.

ADL was also faulted for failing to list references. This, Weedon admitted, might almost be a legitimate complaint, but not quite. Ninety percent of the work done by the ADL subsidiary that would handle Medicaid has been with the state.

The RFP itself included a discussion of the welfare program the company has been running for Massachusetts and several members of the selection committee were people with whom the company worked on the project. It therefore seemed superfluous to list that effort, Weedon said.

Following Weedon, Citibank vice-president Alan Newman told the review board he had basically the same reaction to the outright rejection of his company's proposal without benefit of the "normal" oral presentation to clear up possible misunderstandings.

Tenn. Asks End to Tax Suit

NASHVILLE, Tenn. — The State of Tennessee has filed a motion to dismiss the suit that seeks a declaratory judgment on the state's right to tax software filed by Robert M. Sherin [CW, June 27].

The state argued the court lacks jurisdiction over the subject matter of the complaint, which fails to specify a claim upon which relief can be granted.

Tennessee also indicated the plaintiff, Sherin, should pay taxes and then sue for a refund, rather than file a complaint prior to the commencement

of the tax.

In his reply to the court, Sherin stressed his suit seeks to enforce constitutional provisions providing for the supremacy of judicial decisions. He refuted many of the state's arguments.

Sherin, president of Nova Computing Services, Inc. of Florida, filed his suit after the legislature voted for a tax on software, although the Tennessee Supreme Court ruled software is intangible and nontaxable under that state's law in the case of *Commerce Union Bank vs. George M. Tidwell* [CW, Aug. 30].

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Withington Admits IBM Ties at Antitrust Trial

By Catherine Arnst
CW Staff

NEW YORK — A government witness who fought a subpoena to testify in the U.S. vs. IBM antitrust trial because of the hardship he said it would cause him may have had other reasons for being reluctant to testify against the industry giant.

Frederick K. Withington, an expert on the computer industry from Arthur D. Little, Inc. (ADL), recently testified he is currently awaiting publication of a book he wrote as part of an IBM-sponsored program.

Further, Withington said he owns 78 shares of stock in IBM valued at approximately \$17,000. He obtained his first shares in 1967, but purchased 40 more in August 1976. He appealed his subpoena in March of 1976.

Nevertheless, although Withington was reluctant to take the stand, he has not been reluctant to talk once there.

Environment for Systems Programming, is scheduled for publication by Addison-Wesley, Inc. in January 1978, Withington told the court.

The proposal for the book, conceived in its present form in 1974, was presented to a board of IBM personnel for approval and accepted at that time.

Withington was to have received \$12,000 indirectly from IBM, paid through the publisher. Of this sum, \$4,000 was an outright grant paid when the proposal was accepted; the

balance was an advance against royalties. Withington has received a total of \$7,000 of the funds to date.

Publication of the book and the receipt of the \$5,000 balance depend on final approval of the completed manuscript by the same IBM board. This has not yet been given.

ADL Balks at Subpoena

After producing approximately 90,000 pages of documents to IBM, ADL attorneys filed a motion with the court to quash an IBM subpoena for further production. Judge David N. Edelstein, the sole arbiter in the case, agreed to delay his decision on that motion until Withington has finished his testimony.

Meanwhile, Withington's testimony

as an industry expert has closely paralleled that of Dr. Alan K. McAdams, the government's chief economic adviser for this trial [CW, July 11, 18]. Withington writes an annual report for ADL subscribers on the state of the computer industry and a five-year forecast, and much of his testimony was based on knowledge he gained while writing these reports.

IBM Share 68.4%

From the reports, he drew a chart showing IBM started out with 71% of the general-purpose computer systems market in January 1961 and has 68.4% of that market now. The value of the installed base of general-purpose systems in the U.S. has risen from \$1.8 billion in 1961 to \$46.5 billion in 1977.

As of January 1977, IBM's next largest competitors were Univac, Honeywell Information Systems, Inc. and Burroughs Corp., each with 7.1% of the market.

The percentages held by Univac and HIS have dropped consistently from 8.9% and 9.1% respectively in 1973, Burroughs, on the other hand, has increased its market share since then by two percentage points.

The only other competitors IBM had in the general-purpose systems market as of January 1977 were Control Data Corp. (3.6%), NCR Corp. (2.6%) and Digital Equipment Corp. (4.1%), according to Withington. Six others have left the market since 1961, he added.

Two Accused Of Passing Tapes To Eastern Bloc

MIAMI — Two men arrested here in conjunction with an alleged plot to transport components of a cruise missile to Soviet agents are also suspected of passing magnetic tapes and microfiche to Eastern Block operatives.

Carl John Heiser III and Carl Lutz Weischenberg were recently arrested on the technical charge of failing to register as agents of a foreign government and are awaiting trial scheduled for Sept. 26 in Federal District Court here.

The Soviets allegedly were in the market for components of the cruise missile, uranium and 40 aircraft gyroscopes made by Litton Industries, according to an affidavit by FBI special agent Bill J. Windland.

Weischenberg, a West German citizen, is reportedly slated to stand trial in West Germany on charges of high treason for allegedly supplying Soviet Bloc nations with material from West German DP firms.

Heiser, an American, indicated he had grossed between \$150,000 and \$200,000 in the last year and a half from delivering microfiche orders for IBM, Memorex and Bendix programs or for equipment such as "Bendix computer drive shafts," according to the affidavit.

Some of the materials delivered were IBM tapes for whose delivery an informant received \$7,000, but which cost about \$497.75 when purchased from IBM, according to the affidavit.

The affidavit did not mention the contents of any of the media and no information was available from the FBI or IBM.

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Computer Power, Inc., Jacksonville, Florida, provides complete data processing services for a number of banks, mortgage bankers and saving and loans whose mortgage portfolios have over 1,250,000 mortgage loans valued at over 24 billion dollars.

Over 8,400 program modules are now used to provide client services—modules which require storage space equivalent to 2.7 million card images.

Until The LIBRARIAN was installed, program storage and management was an expensive and time consuming problem

According to Technical Support Manager Roy Fileger, "Before we installed The LIBRARIAN, we stored everything on 17 IBM model 2314 disk packs. That meant we had 17 different source statement libraries. We were making 1000 pack changes a month and we were spending over 50 hours of computer time each month reorganizing files."

"Program standardization was a problem too. Programmers would make changes to one pack and not duplicate the changes on the other packs."

The LIBRARIAN enabled Computer Power, Inc., to cut disk storage by 94%.

After The LIBRARIAN was installed 2 years ago the entire source statement library was immediately compressed with the result that Computer Power, Inc., using the IBM 3330 disk system, now stores all of its 8400 program modules on a single disk, constantly on-line. The benefits were far greater than just the savings in disk use, however. Time required for file reallocation was virtually eliminated. Elimination of disk shutdowns and disk changes added another 50 hours a month of usable computer time. And standardization rapidly improved because common program changes no longer had to be duplicated on many different disks.

"We really have file backup now. And that's tremendous."

Roy Fileger remembers, "When we had 17 packs our backup and savings procedures were extremely time consuming. Now, with The LIBRARIAN and only one disk pack, we are able to save everything every single day in just 20 minutes."

ADR's MetaCOBOL is doing more than just conversion.

Computer Power, Inc., is in the final phases of conversion of more than 6000 program modules from DOS to OS/ANS. According to Roy Fileger, "We're running through MetaCOBOL and coming out with state-of-the-art programs, OS/ANS, single entry, single exit with I/O completely changed. All the programs we have converted so far have executed perfectly the first time."

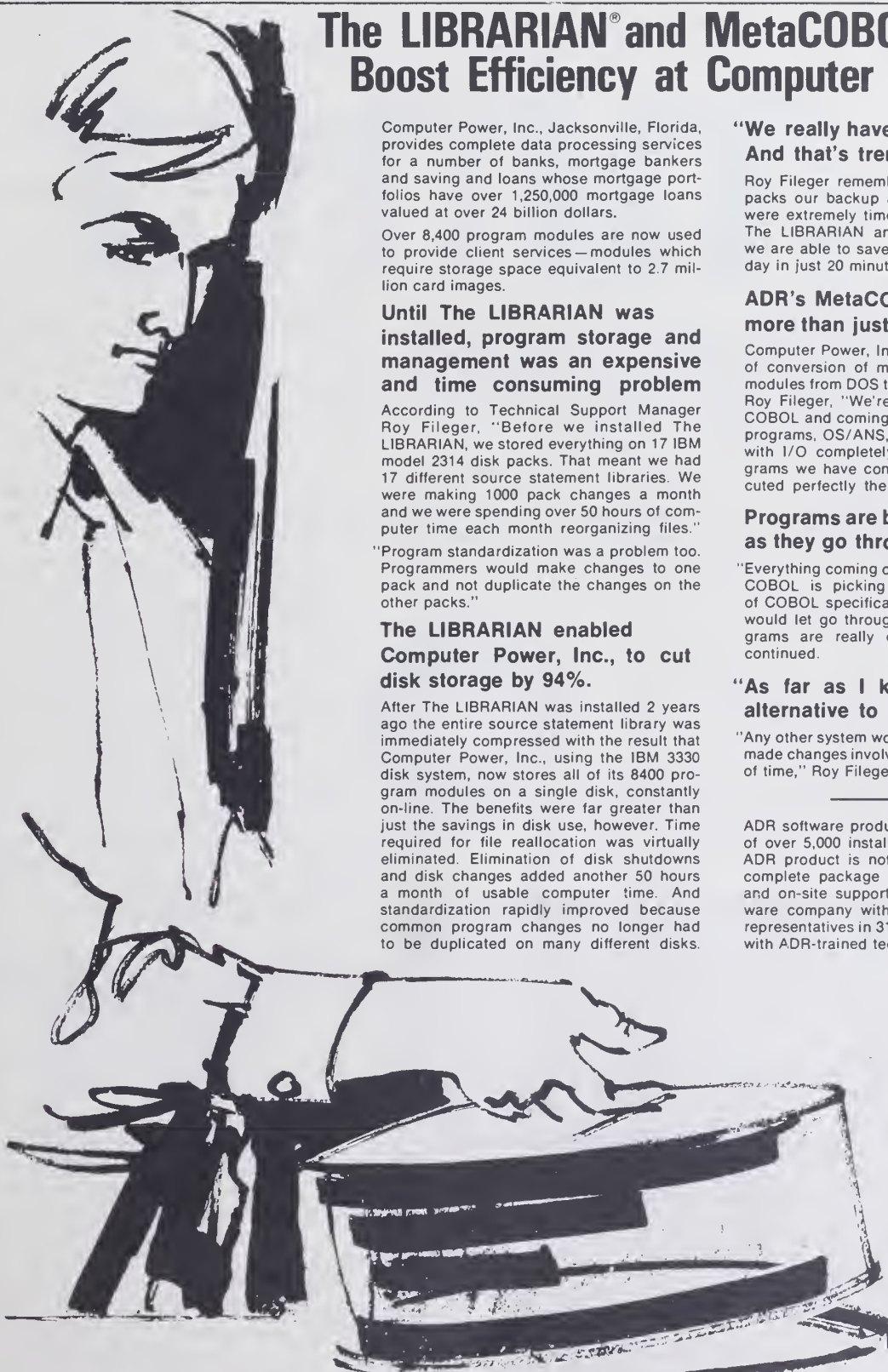
Programs are being standardized as they go through MetaCOBOL.

"Everything coming out is looking alike. MetaCOBOL is picking up errors in violation of COBOL specifications that the compilers would let go through. As a result, our programs are really coming out clean," he continued.

"As far as I know, there is no alternative to MetaCOBOL."

"Any other system would have required hand-made changes involving a staggering amount of time," Roy Fileger added.

ADR software products are an integral part of over 5,000 installations worldwide. Each ADR product is not just a program, but a complete package with full documentation and on-site support. ADR is the only software company with 50 branch offices and representatives in 31 countries—each staffed with ADR-trained technicians.



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Audit Finds SSA Net Open to Privacy Abuses

(Continued from Page 1)
(HEW) said.

But HEW officials are not aware that SSADARS has been misused, according to Edward W. Stepnick, assistant inspector general for auditing at HEW. In a letter to SSA Commissioner James B. Cardwell, Stepnick said the audit had not attempted to find instances of fraud and abuse, but rather to determine whether the potential for misuse of the SSA system existed.

The importance of security within the system and in the use of its terminals "cannot be overemphasized," the report stressed. Containing records on more than 27 million Americans who receive Social Security and Supplemental Security Income payments, the system employs a network of approximately 2,200 terminals across the country.

The terminals provide a user with the communications link required to transmit data on the beneficiaries of various SSA programs to the agency's headquarters in Baltimore. "The data processed through SSADARS is used to add, delete or change information on the computerized records of any SSA program," the HEW audit report noted.

Released by Representatives John E. Moss (D-Calif.) and Charles Rose (D-N.C.), who have also asked the General Accounting Office (GAO) to look into SSA's computer operations, the audit said the weaknesses found in the system's security procedures and controls "adversely affected SSA's capability to protect the integrity of its systems and prevent a compromise of personal data retained in program records."

Abdication of Security

Among the problems identified by the audit was the abdication of management and security of the SSADARS terminals to each individual SSA central office component. Limited central guidance resulted in insufficient emphasis on terminal security, the HEW study indicated.

Security procedures regarding the terminals varied in detail in different

parts of SSA's organization, and the security program was managed by only a few employees located at the lower levels of the agency's organization structure, the report said. Further, these employees were assigned responsibility for security as an addition to their usual workload.

As a result of the lack of management, terminals were located in unsecured and uncontrolled areas and were left unlocked overnight, the report noted. The HEW audit agency visited 69 of the 72 keystations attached to the 35 SSADARS terminals at SSA's main headquarters in Baltimore and found 33 keystations — almost 50% — were in areas that couldn't be secured during off-hours.

Passwords needed to unlock the terminals were known by an excessive number of employees, the report said. Further, the system was designed in such a way that when an employee un-

locked one keystation to a terminal, he unlocked them all.

Reports kept to help management monitor the locking and unlocking of terminals were untimely and inaccurate, making them ineffective as flags to possible system security violations, HEW also found.

Finally, programming logic — designed as internal system security to limit the types of transactions which could be processed by each terminal — was ineffective, the report charged. Use of an alternate mode procedure provided a terminal operator with the ability to process claim or transaction data not authorized by his terminal's assigned identification code, but permitted under another terminal's code.

Although SSA recognized the importance of security controls and was devoting increasing effort to security improvements when HEW conducted its audit in July and August of 1976, more

needed to be done, Stepnick said in his letter accompanying the report to Cardwell.

Specifically, improvements were needed in management guidance and emphasis on systems security, security over terminal access and use and effectiveness of programmed security clearance systems, he stated.

Stepnick pointed out that "prompt action" was taken by Cardwell's staff to identify an internal systems control deficiency. Subsequent HEW tests showed corrective action was effective in preventing unnecessary and indiscriminate use of the identification number of one terminal for that of another in addressing the system, Stepnick noted.

In addition, as a result of the HEW audit, the SSA last August established a systems security staff in the Office of Operations Systems and Coordination, the report said.

Mitre Study Provides Wiretapping Lesson

(Continued from Page 1)

known report on wiretapping" written by Mitre Corp. for the White House Office of Telecommunications Policy (OTP), according to the congressman.

An OTP spokesman stated, however, that the document obtained by Moss is not the third volume of the study, but "working papers" given to OTP by Mitre. All the information contained in the "third volume" is "commonly available information," he said.

OTP thought it best to lock up the "working papers" to prevent their aiding a potential wiretapper who would have in one document all the information needed to intercept communications, he said.

The report gives step-by-step directions for the would-be tapper, including how to rent property through which lines to be tapped pass, how to dig up cables and how to attach a gas pressurization bypass to avoid detection.

It also enumerates items that might be used for monitoring, such as head phones, modems, a microprocessor,

standard oscilloscopes, tape recorder and printers.

The study was originally undertaken as part of OTP's review of the current federal wiretap laws, according to the spokesman. The agency wanted to understand the flaws and strengths of current communications facilities in order to make recommendations on how to strengthen those laws, he said.

Never intended for wide distribution the study is now being edited and reprinted along with the wiretap laws for release to the public as a result of the publicity the report has received, the spokesman noted.

Awarded to Mitre, possibly on a sole-source basis, on June 15, 1976 for \$47,034, the contract for the report resulted in a two-volume document called "Study of Vulnerability of Electronic Communication Systems to Electronic Interception." Those volumes are dated January 1977.

Also dated the first month of this year, the document Moss has is entitled "Selected Examples of Possible Approaches to Electronic Communications Interception Operations" and "deals solely with surreptitious methods of wiretapping," the congressman said in a letter to the Comp-

troller General of the General Accounting Office (GAO) that asked for an investigation into the study's purpose.

Referring to the third volume, or working papers, of the study, Moss wrote, "Nowhere in this unique document is there any mention of legality, court orders or similar cloaks of authority under which such privacy invasions are grudgingly and occasionally sanctioned."

"In effect, then, this publication, ordered and paid for by federal funds, appears to be a how-to-do-it manual on non court-ordered wiretapping," the congressman concluded.

Moss asked the GAO to determine why such a "how-to" book was ordered by the Ford Administration and why it was needed. In addition, he wondered whether its publication could lead to significant privacy invasions in violation of existing U.S. law.

Further, the congressman wanted to know whether the manual's creation was consistent with congressional appropriations to OTP and whether the third volume was deliberately withheld from distribution and from GAO auditors when they conducted a previous investigation into related issues.

HEW Accuses Manager

(Continued from Page 1)

claimed some of the more than 200 meals in question on his expense account.

The award of the contract for the student loan management system to On-Line Systems — an award made on June 27, 1975 for an initial \$1 million that has since increased by \$6.5 million — is under investigation by the U.S. Attorney's Office here as well as by the HEW Inspector General, an HEW spokesman said last week.

"The basis for the investigation is gratuities or irregularities concerning the award of the contract," Robert Wilson, a member of the HEW Inspector General's staff, stated. He noted that the investigation is not confined to Parker and that the computer project manager has a right to rebut HEW's charges at a formal hearing.

Parker must challenge the accusation

by the beginning of September or lose his job, according to the letter he received from John Ellis, Executive Deputy U.S. Commissioner of Education. Parker, who had no comment on the matter, was reassigned to another post in HEW last May when investigators initially raised questions about the favors he allegedly received, the spokesman said.

HEW officials would say no more about the investigation at this point except that On-Line's performance of the contract is not the real issue.

The *Washington Post* reported that HEW sources indicated the meals in question were purchased by Gilmore S. (Bim) Wheeler, president of an On-Line subsidiary — Business, Industry and Management, Inc.

Neither Wheeler nor On-Line Systems officials were available for comment by press time last week.

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WANG

'Washed-Out' User Up Again in Two Weeks

By Ann Dooley
CW Staff

JOHNSTOWN, Pa. — Two weeks after its IBM System 3/15D was destroyed and its data modules were soaked by the waters that flooded this town, Crown American Corp. is "up and running."

The real estate company just completed the first payroll on new equipment IBM sent after the old System 3 was destroyed, DP Manager Mike Shutacka said.

"We haven't lost one record, as far as we know," Shutacka said.

Within a few days after the flood, and before the new system was installed, data was being processed on a System 3 owned by Kimball Engineering, Inc. in nearby Evansburg.

"We've had an informal reciprocal agreement with Kimball and were able to work on the night shift," Shutacka said. "We worked on the vendor listings to keep processing the payables."

"Now, we're located in rented space from IBM," he said, "and it's on a hill."

The work will continue there until the company relocates to larger headquarters, something it was planning to do anyway, he said.

Besides damage to the CPU, the worst loss was the accounting records, which were wiped out, he said. But that is

Response Strong For Revamp Tips

WASHINGTON, D.C. — A "significant number" of suggestions on how to revamp the procurement and management of DP facilities within the federal government have been received by the Office of Management and Budget (OMB).

Now the office is seeking the names of people who are willing and able to evaluate the ideas and develop whatever recommendations seem appropriate, a spokesman said.

The comments have come largely in response to appeals in a widely circulated letter from Wayne Granquist, associate director, of the President's Reorganization Project within OMB [CW, July 11], and in the *Federal Register*.

As soon as they can be categorized, the ideas are being forwarded to project personnel who are drafting "scope-of-work" assignments for task forces to be organized, hopefully, in the late summer or early fall, the spokesman said.

Implementation of the initial recommendations from the task forces should begin within the year.

Contrary to reports published earlier, personnel for the task forces will be drawn largely from outside OMB. The spokesman said the office wants "as diverse a group of individuals" as it can get from government, industry and the academic environment.

Although the "deadline" for suggestions has passed, the spokesman emphasized that ideas are "always welcome. And so are the names of people to serve on the task forces."

Comments and names should be addressed to Kenneth B. Allen, Information Systems Division, OMB, Washington, D.C. 20503.

pretty much a matter of rerunning whatever it takes in printout time.

"Also, we lost the paperwork, the invoices and things that were in progress at the time of the flood," he said. Those kinds of things will undoubtedly be sent in again, he added.

"We have a daily and weekly backup system and the weekly is kept off-site," he explained. Right now, "we're considering using an off-site daily backup too."

"We're two weeks behind in processing the normal work and it will take another two weeks to catch up, so it will be about a month before operations are running on schedule again," the DP manager predicted.

Shutacka explained that the computer was located in the basement be-

cause the Johnstown area was thought to be flood-free. There hadn't been a flood since the '30s, he pointed out.

At one time the equipment was located on the second floor, but was moved to the basement for space reasons, he said.

When the company relocates "we definitely won't be in the basement anymore," Shutacka said. There's still six inches of mud covering the computer, he added.

Although the damage is still being assessed, Shutacka said the cost to the company for the CPU was over \$300,000 and estimated an additional \$20,000 to \$30,000 loss in other equipment and supplies.

Shutacka, who was vacationing in Florida when the flood occurred, re-

turned immediately and began working with the IBM emergency team set up to help in recovery operations.

IBM is "doing an excellent job," Shutacka said. "It's bent over backward to help us out."

The Crown American system handles complete accounting operations for the real estate company and for two Sheraton hotels and two Holiday Inn hotels which the company owns and operates.

Clean-up operations are still under way in Johnstown. "It will be years before the area recovers," Shutacka said. "Entire roads are washed away and the dust is so thick some people wear masks."

"It's hard to believe unless you see it," he added.

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Intel AS Users Find IBM Software Transparent

(Continued from Page 1)

The CPU was the only thing the university replaced. Running under OS/MVT Release 21.8, the system uses mostly IBM peripherals.

Maple plans to change to an IBM VS/2 operating system soon, but expects no problems; the installation is already operating VS/2 successfully, but not yet for production.

Throughput Up 50%

Scientific Computers, Inc., of Minnetonka, Mich., has had its A/4s for about two weeks and is getting 40% to 50% greater throughput than it did with its IBM 370/145, according to Richard Walter, president.

The company replaced the first of its two 145s with the AS/4. A second AS/4 is scheduled to be installed within the next few weeks.

When the processors were swapped, no changes had to be made to the DOS operating system, Walter said. The switch took about five hours, although

the Intel processor was on-site before that and field service people were running diagnostics on it.

The company, with an on-line system serving about 190 terminals installed at customer sites, runs a service bureau operation.

The throughput improvement it is experiencing with the Intel machine is based on switching from a 512Kbyte 145 to a 1M-byte AS/4 "without doing anything to use the other half meg of storage," Walter said. "The throughput is 'pretty much what the [AS/4] looked like on paper," he added.

Cost comparisons between the IBM and Intel system are difficult to make because the Model 145 was a purchased machine while the Intel system is leased, he noted.

Faced with upgrading its 145s, Scientific Computers made a study and found the "best bang for the buck" was with the AS/4 because it is a faster machine, he said. It sold both of its

145s to make room for the AS/4s.

Information Sciences, Inc. (ISI) of Providence, R.I. brought its AS/4 up in about a day and a half with few problems, according to William Renfrew, senior vice-president.

Job accounting shows the AS/4 is 2.5 to 2.8 times faster in CPU cycles than the 370/145 it replaced, Renfrew said.

"Everything we're running runs exactly the same on the AS/4 as it did on the 145," he said. There were no changes of any type to any program and the DOS operating system is definitely transparent to the Intel system, he explained.

ISI also runs a second 145 it acquired under a long-term lease from IBM. This system has been running for about three and a half years, but a comparison of the IBM cost then with the Intel cost now shows a savings of several hundred thousand dollars, Renfrew said.

The company is now running under DOS/VS and an upgrade to VM/370 is planned. So far there have been no software problems with the Intel system and the operating system upgrade will proceed as originally planned, he said.

ISI is a DP service bureau for Industrial National Corp.

'Without a Ripple'

Ken Pollock, technical director at the Cooperative Computer Center that serves as a regional computing installation for three Illinois state schools running six remote job entry systems from four different vendors, had a similar story to tell.

The center's 2-byte AS/4 was installed only a week ago. Pollock said the conversion went "without a ripple."

The system was rolled in on a truck Sunday morning to replace the center's 1M-byte IBM 370/145.

Tuesday afternoon the operating system was loaded for 12 hours of benchmarking, and at midnight "we were

satisfied."

At that time "we cabled across our disks to exercise our software and after one and a half hours we started production and have been running continually since," Pollock said.

Here, too the CPU was the only element of the system to be replaced.

The AS/4 runs IBM's VS/1 Release 6 operating system.

Pollock, who actually works for Systems and Computer Technology Corp., a facilities management firm that operates the center for the state, said going to Intel involved a certain element of risk. But after seeing the benchmarks, it was a simple decision to make, he said.

DP manager Clarence Millfap, who switched from IBM to Intel in 1969, has great faith in the firm as a result of their eight-year relationship; when it began marketing the AS line, he was confident the system would be a good one, he said.

Millfap's firm, Equitable Life Insurance Co. in Des Moines, Iowa, took delivery on a 1M-byte AS/4 on June 20 and was into production with it by June 24.

Equitable's conversion was somewhat different than the usual since "the 4" was brought in — instead of a 370/148 — to replace a three-channel IBM 360/50 with 512K main memory.

But "the cross-over was so smooth it scares you a little bit," he said.

Millfap is very happy with the AS/4's performance — even under IBM's archaic DOS Release 27.1. CPU processing time is twice as fast as the Company's previous 360/50, he said and jobs that used to take four hours now take about two.

"That's not to say that a job can't get bogged down in printing," he added.

By October or November, the insurance company plans to convert to DOS/VS Release 33. Millfap expects that conversion to take only about 28 hours.

Proposal Book Scores Again!

The spectacular rise in sales of *How to Create a Winning Proposal* has scored another net gain this quarter for Mercury Communications, Inc. shareholders. A timely and innovative "how to," *Winning Proposal* has racked-up a stunning track-record since its publication early last year—with the largest volume of sales coming from the aerospace/defense and computer/EDP industries.

Written by two highly-qualified proposal consultants, the book is rapidly becoming the standard text for use in government, commercial, OEM and service company proposal efforts. It is currently being used in GSA, NASA, DOD, HEW, ERDA and other government/military agencies as an aid in proposal evaluation.

Using a step-by-step instructional technique, the authors provide a virtual roadmap to the entire proposal process... including technical, cost and management section checklists to ensure the proposal team of covering all the important bases. Excellent guidelines are given on contents, structure and methods of preparation for both solicited and unsolicited proposals.

A tactical approach is used for developing an effective "win strategy," mobilizing the proposal team and controlling the input of the various team members. Detailed instructions on how to analyze and respond to RFP's, RFQ's and IFB's are also included.

Copies are available pre-paid only from Mercury Communications, Inc. 730-CW Mission, Santa Cruz, CA 95060. \$55 includes 3-5 day delivery inside USA. In Calif. add \$3.12 tax

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Programmer Gains Too Low

(Continued from Page 1)

the possibility of transferring information across the network because this also transfers technological skills.

If the transference occurs across national boundaries, one can envision the emergence of an information segment in all national economies, even in the small ones, he said.

The potentially positive effect of information transfer on economic progress is widely recognized, Tanaka noted, but problems also come with it — problems relating to safeguarding the ethical and legal interests of individuals and organizations while storing and transmitting information.

"Personal as well as nonpersonal information is already flowing across many international boundaries with few controls or restraints and little accountability," he noted.

And while many businesses and services have improved as a result of this information exchange, these activities are not yet covered by any international law, convention or agreement.

Many nations have begun to enact privacy legislation, but each takes differing forms and levels of definition. "The effect of piecemeal legislation, even when implemented in a com-

pletely open spirit of cooperation, is to restrict the flow of data to the lowest level," Tanaka said.

Those areas with strong safeguards will be unable or unwilling to transmit information to areas with less data protection, he added.

"In competitive situations, the rules for handling data may be used as excuses for lack of cooperation. Consequently, even as safeguards are being defined and implemented, hopefully on a uniform international basis, there must be assurance that data flow and international commerce will not be unduly inhibited," he said.

Developing Nations

One cannot discuss the transfer of information or technology without mentioning the developing countries, Tanaka said.

While many people believe computers are essential to the development of a country, it is difficult to know how valid that premise may be.

"Not only is it not evident that computers can assist, they may in fact represent a diversion and a waste of economic resources unless they are realistically and carefully used," he cautioned.

Also Plan DP Ethics Code Inquiry

House Republicans Revive Privacy Task Force

By Nancy French
CW Staff

WASHINGTON, D.C. — Republican members of the House of Representatives have resurrected their task force on privacy to study some of the issues left untouched by the Privacy Protection Study Commission. Under the leadership of Barry Goldwater Jr. (R-Calif.), the task force will hold hearings and study the problems posed by electronic mail, electronic funds transfer, wire tapping, mail covers and Interpol.

The task force will also reopen its inquiry into whether DP professionals should adhere to a code of ethics and

standards of conduct such as those observed in the accounting community.

Before the task force was disbanded in 1974, it recommended that DPs do need such a code, a spokesman indicated.

Along with accountants, DPs share responsibility for the business activities of a company and, in some ways, have greater control, he noted, for it is they who control the impact and use of technology.

Another area the task force will be concerned with is Congress itself.

Congress, which includes the Library of Congress, the Government Printing Office, the Copyright Office, the Office of Technology Assessment, the

Budget Office and several others besides the House and Senate, is an enormous organization, the spokesman pointed out. The Library of Congress alone, excluding the Congressional Research Service, employs 5,000 people.

A number of apparent privacy violations reported by congressional employees to Republican members of the House have raised their concern about congressional record-handling practices.

For example, a number of library employees complained they have been required to sign annual performance evaluations that were blank; once signed, these documents were kept from them.

The task force will attempt to prepare a description of the existing practices, including the philosophical arguments for and against any specific procedures. In addition, it will examine the risks of privacy legislation for the private sector that will hit upon costs, as well as the possible outcome of increased bureaucratic regulation that may result.

Task force members include Charles Whalen (Ohio), Robert Lagomarsino (Calif.), Micky Edwards (Okla.), Philip Crane (Ill.), Margaret Heckler (Mass.), John Rousselot (Calif.), Jack Kemp (N.Y.), Dan Quayle (Ind.), Frank Horton (N.Y.) and John Cunningham (Wash.).

Swedes Decry Lack of Privacy, Blame It on DP

STOCKHOLM, Sweden — Next to unemployment and inflation, the protection of privacy is one of the most vital issues facing the community, according to a public opinion survey conducted by the National Central Bureau of Statistics here.

Nearly one-third of some 1,000 persons interviewed declared there is less privacy today than five years ago, and one in three of this segment blamed this on computers, data registers and the like.

Fifty-four percent of the total believe the situation is largely unchanged, while 6% detected an improvement. The better educated were more pessimistic than the rest, the bureau said.

About 10% of those surveyed claimed to have experienced some form of intrusion into their private lives over the past five years, a third of them linking the occurrence with advertising or marketing activities. One in five cited public opinion surveys or the actions of the authorities.

Four out of five of those interviewed think computers allow the authorities to give better service to the community, while two-thirds wholly or partly hold the view that more data is accumulated in computers than is really necessary.

Forms Due For CCP Exam

CHICAGO — Registration forms for the Certificate of Computer Programming (CCP) exam must be in by Aug. 31, according to the Institute for Certification of Computer Professionals (ICCP), sponsor of the exams.

On Oct. 22, the test date, three different examinations will be offered — oriented toward business, scientific and systems programming.

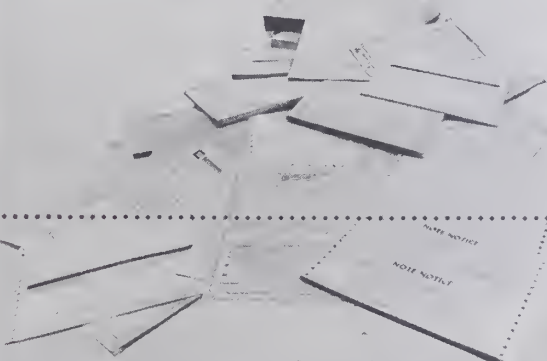
The top 50% of the senior-level programmers practicing today should be able to pass the exams, according to the ICCP.

The fee is \$75. Study guides and other details about the CCP as well as the Certificate in Data Processing examinations can be obtained from the ICCP's office at 304 E. 45th St., New York, N.Y. 10017.

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DP Helps States, Utilities Monitor Air Quality

By John P. Hebert
CW Staff

SAN DIEGO, Calif. — Data communications and computer technologies have been instrumental in helping some state power companies and environmental protection agencies (EPAs) monitor the air quality in their cities and towns.

And for the power companies the application of DP is helping avoid fines of \$10,000/day by making sure the companies don't introduce more than a specified amount of pollutants into the air at any given time.

Stagnant air is the power companies' worst enemy. When winds die power companies must use low-sulfur fuels, which cost \$1.25/barrel more than those high in sulfur that can be used in clear weather.

Because a utility can burn 10,000 barrels of fuel each day to generate electricity, it is advantageous to shift from one fuel to the other, depending on the weather.

The power companies have either procured their own computer and communications systems or hired DP experts from consulting firms as a matter of self-protection, according to Al Budd, marketing vice-president at Monitor Labs, Inc. here.

In fact, because federal and state legislation is in favor of the consumer, in this regard, air pollution monitoring and data gathering has become a \$100 million annual business, according to Budd, whose company developed and sells an on-line air quality data

monitoring (Adam) system to utilities and state EPAs alike.

Station Configuration

The Adam system's central station consists of a Data General Corp. Nova minicomputer with from 16K to 32K of main memory, a Teletype Corp. ASR 33 teletypewriter, an 800 bit/in. DG or Kennedy Co. magnetic tape transport and a Centronics Data Computer Corp. 101H line printer, Budd said.

It also includes a Remex Corp. Model 6375 paper-tape punch and a "low-cost" CRT such as a Beehive Medical Electronics Corp. or Lear Siegler, Inc. console, he added.

Telephone lines are also a necessity for Adam, as are modems to interface the ML-7000 central station with data loggers and up to 20 remote air-monitoring stations, each with a dozen or more chemical and weather sensors in the field, Budd said.

The systems are currently being used by EPAs in states including California, Massachusetts, Washington and Wisconsin and by power-generating companies such as Georgia Power, Geomet in Maryland and Gulf Power in Florida.

"The old way of measuring air pollution is no longer acceptable," Budd said.

"Until recently, the various analyzers were placed in a remote shelter and data was recorded on strip chart recorders or magnetic tape.

"Periodically, someone would pick

up the tapes. If a sensor or recorder stopped operating, it might be hours before the malfunction was discovered. Also, there was no possibility of on-line control in case of an emergency," Budd said.

Continuous Monitoring

In the Adam on-line telemetry system, all of the data is being monitored and validated continuously. Calibration of each sensor can be initiated from the central station by one person keeping tabs on every sensor in the network and measuring as many as 100 parameters.

If data from a sensor or a remote data logger shows excessive errors, the operator can take immediate corrective action.

Quick correction action is necessary because in order to clean the air the state-controlled EPAs require power companies and refineries to prove that the pollutants being emitted are not adversely affecting the atmosphere.

Adam consists of a network of Monitor Labs data loggers - one at each remote station - connected to the minicomputer through leased or dial-up lines using Vadic VA305 G or VA305C 300 bit/sec modems respectively, and Vadic VA801AC pulse dialers.

Each remote data logger digitizes and formats the data from the sensors at its station before transmitting to the Adam central station, where the necessary conversions are performed on a real-time basis.

"We use Vadic modems in our Adam system because they're cost-effective and reliable. We can buy them cheaper than we can build our own. We've designed them into the system," Budd explained.

"Probably the most important feature is Vadic's local and remote loopback capability. We have implemented these test features into our hardware and software so we can quickly check out the complete network," he continued.

"Using our software and Vadic's diagnostics and displays, it's simple to identify a problem and localize it to the phone line, the modem or our hardware," Budd said.

A system check is initiated if the operator at the central site detects excessive errors from a particular remote station.

First the modem at the computer site is tested. Under Adam software control, the modem is put into local test, where the modem transmitter and receiver are set to the same frequency and the transmitter output is connected to the receiver input.

In this mode, data is looped from the computer through the modem and back. This usually consists of typing information on the console keyboard and checking its validity. The test checks out the local modem and data terminal.

If the local modem checks out, a remote (echo) test is made. Under software control, the specified remote station is selected, all other stations on the line are blinded and the remote modem is put into the remote test mode.

Remote test disconnects the modem from the data logger and connects the modem receiver output to the transmitter input. Data now received by the modem's receiver will be retransmitted to the central computer.

This test verifies both the remote modem and the communications channel. If both the local and remote tests prove valid, the problem is isolated to the remote data logger or one of the sensors. A technician can then be dispatched to the scene for repair or replacement.

The modem's diagnostics can be taken another step in case the local and remote loopback test initiated at the computer site are not conclusive. For example, if the local modem test checks out, but the remote test doesn't, it could be the telephone line or the modem at the data logger.

When this type of ambiguity exists, a technician is dispatched to the remote location and the local and remote tests are done at that end.

If the remote modem is found to be operating using the local test mode and the central computer modem has already been verified, the problem must be in the telephone line. At that point the phone company can be called in.

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Those selected in past years have included scholars, engineers, corporate employees, academic professors and administrators, medical doctors, architects, local public officials, lawyers, oceanographers, a policeman and a symphony conductor.

Application materials and additional information can be obtained by sending a post card to The President's Commission on White House Fellowships, Washington, D.C. 20415.

Requests for applications must be postmarked no later than Nov. 15.

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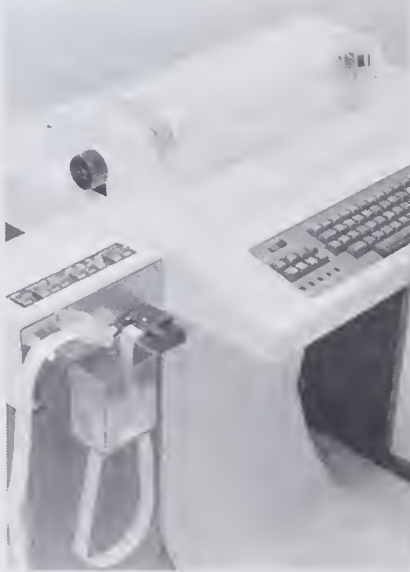
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DP-Aided Program Funded By State

Handicapped Kids Learn at Home Via Cable TV

By Molly Upton
CW Staff

AMHERST, N.Y. — Handicapped children unable to attend school on a regular basis are receiving instruction at home on television screens through a program here now being financed by state funds.

Originally a two-year pilot program financed by an \$817,000 grant from the Department of Health, Education and Welfare's bureau of education for the handicapped, the project this year will be expanded to tutor about 500 students, according to Jim Morilla, an associate in the state's Department of Education, Bureau of Program Development.

Previously available only to about 100 students in Amherst, the instructional program will be expanded to reach students' homes and some schools in Buffalo, Tonawanda and Kenmore as well, he said.

The same system is being used at the Human Resources School for the physically handicapped in Alberton, Long Island, for physically handicapped on a closed-circuit basis but will soon be available to homes there, too.

The cost of replicating the system is under \$200,000, as original development is now completed, he said. Unit costs will decrease even further when new video transmission techniques currently being developed increase by ninefold the number of students who can use a given channel on the cable TV system, he added.

In the pilot project, the \$150 cost of the keyboard/coupler was underwritten by the grant. Morilla's biggest problem is finding the financing so that families don't have to pay for the units. He is attempting to form a consortium to obtain funds or else arrange some sort of charge-back scheme to school districts.

The program provides instruction to children who are physically handicapped, emotionally disturbed and neurologically impaired as well as chronically ill and hospitalized.

Interaction Via Keyboard

A student dials the central computer, places the phone in a special acoustic coupler and interacts with the system via a keyboard attached to the telephone. Requested material is delivered by the International Cable CATV system to the students' TV.

The system is called Tel-Catch (Televised Educational Lessons via Computer-Assisted Instruction at Home over Cablevision to Children with Severe Handicapping Conditions).

It was developed by the Mitre Corp. as part of its Time-Shared, Interactive, Computer-Controlled Information Television project (Ticcit).

"Technology has traditionally bypassed the handicapped in the educational field primarily because of the low frequency of handicapping conditions and the high unit production costs," according to Marillo.

"But Tel-Catch, by aggregating enough students to make unit costs lower, is proving that technology is a feasible solution to the special educational problems of the handicapped," he observed.

At the heart of the system is a

Hewlett-Packard Co. 2000F system which has access to three major files of curriculum materials. The first contains eight separate courses ranging from third grade to high school equivalency level.

A second set offers about 350 lessons on a wide range of subjects for grades one through nine, and the third includes a set of simulations and games available in the HP-contributed program library.

Many of the programs were developed by educational researchers at Stanford University and the Palo Alto, Calif. Unified School District.

The 2000F, which is linked to an HP 2100S with 64K bytes and an HP

2100A with 16K bytes, as well as HP disk and tape units, retains a scholastic file on each student and tailors an academic menu to his specific needs, according to Tel-Catch developers.

Teacher's Function

After the student indicates what type of course he wants to study, the computer will locate the last question completed by that student. But the system doesn't rely completely on machines.

A student can punch a key on the keyboard asking for personal assistance. Two special education teachers are available to respond to individual requests.

The Tel-Catch project also includes

material for the children's parents.



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Mayoral Candidate Attacks DP Voting

GREENSBORO, N.C. — Claiming that adopting computerized voting is the same as encouraging vote fraud, mayoral candidate Marion Porter has accused the Guilford County Board of Commissioners of "selling the integrity" of votes in the county by switching to a computerized system.

The Computer Election Systems (CES) voting system will be used for the first time in Guilford County's election this fall, the one in which Porter will be running for mayor of Greensboro.

Porter claimed elections are difficult to "fraudproof" and computerizing elections make them even more so.

The computer programs are very dangerous, she said. Someone could rig the program to winnow out a certain percent of a candidate's votes and no one would ever notice, she charged.

"All sorts of scary kinds of vote fraud could be used to hit particular candidates," Porter said.

Computer systems are not error proof either, the U.S. Labor Party candidate charged. An error could occur and not be discovered until after the election and perhaps never, she said.

The Labor Party wants a uniform ballot in order to avoid misuse of the system, she said. One way would be to require all voters to sign their names at the polls.

With a computerized system, the only way of assuring honesty is to have a completely independent programmer check each candidate's returns, she stated. However, such a method is impractical and wouldn't even guarantee a fraudproof system, she said.

Program Predicts Recovery Paths Of Open-Heart Surgery Patients

YORKTOWN HEIGHTS, N.Y. — In the critical hours following open-heart surgery, one of the most important questions doctors must face is whether the patient's recovery is likely to be easy or difficult. Survival often depends on an early and reliable answer to this question.

An experimental computer program capable of predicting a patient's recovery pattern — even before surgery — has been jointly developed by scientists at IBM's Thomas J. Watson Research Center here and physicians at the State University of New York at Buffalo and Buffalo General Hospital.

The program is an outgrowth of an earlier effort by the two research groups to develop a computerized procedure for characterizing the types of patient recovery patterns.

While the experimental program has not yet been used during the actual hospitalization of a patient, this goal has a "very high priority" and the earlier recovery-pattern characterization program is already being used on a regular basis, according to Dr. John H. Siegel, chief of surgery at the Buffalo hospital and head of the research team.

Patients Analyzed

In order to use mathematical techniques to predict the recovery path of a patient, IBM researchers analyzed all the data gathered during the recovery periods of 32 patients. They also studied the diagnoses physicians had made at the time the patients were in the hospital. In the end, they had a program that matched the physicians' classifications of the patients' recovery patterns.

Then the computer program was put to the test with data from 54 other patients. The machine was asked to predict a recovery pattern with only one or two days of data.

The computer program predicted the recovery patterns of all the test patients based on data collected immediately after surgery with a reliability of 72%. When the computer was given all the data collected for two days following the operation, reliability rose to 88%, researchers found.

Highest-Risk Cases

The program proved to be 65% reliable in predicting the likely recovery patterns of the highest-risk patients with only the data collected just before an operation. Thus, if a patient seems likely to have a very difficult, even fatal recovery period, a decision could be made not to do the operation at all. Or, if the

operation is absolutely necessary the operation can be monitored more closely than usual.

The recovery prediction program is based on a set of 11 medical measurements collected from the patient through a catheterization procedure. During the recovery period several sets of the measurements may be collected in order to chart the progress of the patient.

Four of the measurements have to do with heart function, four others tell something about the condition of the blood vessels and body chemistry and the remaining three measurements concern lungs function.

Basic Patterns

Patients recovering from open-heart surgery generally fall into one of three basic patterns.

The Type 1 patient will show a rapid recovery with a minimum need for drugs to support the heart and lung functions.

Type 2 patients, on the other hand, will need heavy drug support, although they can be expected to recover satisfactorily.

Type 3 patients require the most extensive drug support and even then the prospect for recovery is marginal.

Without a computer, physicians can not classify a patient's recovery type before surgery and may take up to three days after surgery to

correctly classify all the highest-risk patients.

In addition to improving the recovery outlook from open-heart surgery, Siegel sees the computer program as a possible step toward lowering the cost of medical care by reducing the time spent by the patient in the hospital.

Savings Cited

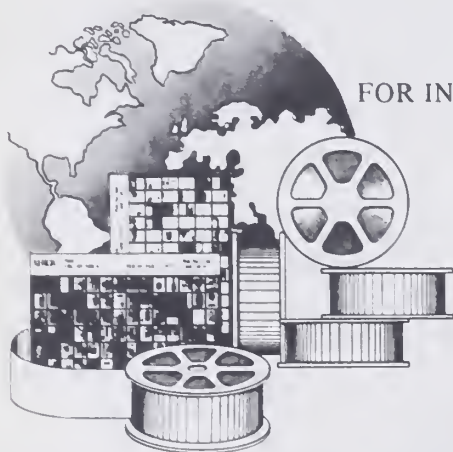
"If we can reduce the long-term stay of patients both in the intensive-care unit and the hospital itself, the saving there will more than outweigh the cost of doing one of these computer analyses," he said.

In the case of a heart patient who does well, the normal stay in the intensive care unit is two days. A patient experiencing a difficult recovery might spend a week, or longer, in intensive care.

"Of course, if you can save somebody's life, that's an incalculable value," Siegel added.

The program was funded in part by grants from the National Institutes of Health.

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To Update Price Changes

Commodity Observers Test Voice Data Entry

By Molly Upton
CW Staff

CHICAGO — A small group of market observers at the Chicago Mercantile Exchange is using voice data entry to update price changes on the commodity exchange here.

Voice data entry and hand-held keypads are two alternatives being considered to replace the 17 space-

consuming terminals currently on the trading floor, according to Glenn Windstrup, manager of information services.

Three voice data-entry units from Threshold Technology, Inc. have been on-line on the floor since April as part of a pilot project.

As observers notice price changes, they utter them into their wireless

microphones. The data is transmitted to a device based on Threshold's 500 microcomputer which is linked with a Data General Corp. Nova, he said.

The information is then transmitted from the Nova to the exchange's IBM 1130, which prepares the data for the ticker and a display board, Windstrup indicated.

The floor of the commodity exchange is an "open-outcry market," with traders shouting price changes.

The three persons using the voice entry units are assigned to watch those commodity markets with a lower volume of trading, he said.

For the other commodities, observers write the quotes on three-by-five cards

which are then relayed to one of the 17 terminals on the floor for input.

It is too soon for a verdict on the system, Windstrup said, adding "we're very much in a test mode and it would be premature to give an evaluation." Threshold provided the software for the system.

As for the wireless hand-held keypad alternative, the exchange is still negotiating for a test system.

And, although the exchange is looking for alternatives, Windstrup said it would be "premature to say the exchange will consider switching, since there's nothing definitive that says the methods are better than the current ones."

Taxpayers' Suit in Trouble

By John P. Hebert
CW Staff

CONCORD, Calif.—Taxpayers contesting the acquisition of an IBM computer system by school district officials here may have lost their bid to have it returned to IBM.

Judge Richard Calhoun handed down a "memorandum of intended decision" last week in the Superior Court of Contra Costa County that disagreed with each point of law on which the taxpayers based their case against the Mt. Diablo Unified School District [CW, April 25].

Although the memorandum is not a final judgment, there is little chance Calhoun will change his tentative ruling, according to Stuart Safine, the taxpayers' lawyer.

Smith vs. Mt. Diablo was initially brought in 1974 and has been bounced back and forth between courts since that time [CW, Nov. 22, 1976].

The present superior court case was brought last January and continued until early last April.

Jerry Smith and the other taxpayer-plaintiffs alleged the IBM 370/125 system had been purchased without open competitive bidding and with funds earmarked for school building construction.

They hoped to recover about \$650,000 — the cost of the computer, peripheral equipment and maintenance costs from January 1974, when the system was installed, to the present.

Claiming he had presented "consistent evidence" against the school officials, Safine said Calhoun's tentative decision was "overwhelming" and makes no sense at all.

"We had one helluva good case and it looks like something funny is going on here," Safine said, claiming Calhoun had only two working days in which he could have reviewed and digested information in the three final briefs.

The judge "obviously had his mind made up" before reviewing the briefs, Safine charged.

The taxpayers "will definitely appeal

Curtis Prize Awarded

EAST LANSING, Mich. — Dr. James L. Lubkin of Michigan State University is the 1977 recipient of the John A. Curtis Award for the outstanding paper presented in the Computers in Education Division at the annual conference of the American Society for Engineering Education (ASEE).

Lubkin is a professor of civil engineering and metallurgy, mechanics and materials science. He received the award for his paper "Teaching Professional Use of the Computer While Teaching the Major."

the case when a formal judgment is handed down, after they discover the bases for the judge's conclusions," he said.



Early computer as developed by the U.S. Government for census calculations.
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Editorial

New Heyday Coming?

Not too many years ago, users were assaulted with a variety of plug-compatible peripherals. Each of these disk and tape systems promised lower prices and sometimes improved operations compared with the IBM peripherals they replaced.

Today a similar competitive area is opening up with the IBM-replacement CPU — the "alternative system." The company generally credited with launching the concept of the alternative system is Amdahl Corp., which began with CPUs that offered improved operating parameters while retaining IBM operating system software.

Since then, Intel Corp. has introduced its Advanced System series and Control Data Corp. has unveiled its Omega system. These alternative systems are being sold as functionally equivalent to the IBM mainframes they replace. In addition, the vendors say, the user gets improved processing power at lower cost.

In the case of Intel and CDC, the user has a choice between using IBM peripherals or using plug-compatible systems supplied by the firms. And varied financing plans are available with many of the alternative systems to optimize the accounting goals of the customer. Intel was a pioneer in this area with its innovative packaged leased plans that originated during the plug-compatible peripheral heydays.

IBM has not been standing still while the alternative systems have

emerged. It introduced the 3033 and soon will introduce a similar CPU, reportedly slated to be called the 3032, and perhaps another model with it.

In addition, the industry leader has lowered CPU memory prices and, in some cases, split operating systems between software and microcode modules, thus trying to slow down the alternative system concept.

But early users of the alternative systems are pleased with their operating benefits and the associated financial savings. There is every indication the alternative system area will grow (see series beginning on Page 39).

It is still too early to say whether the alternative systems will become as popular as the plug-compatibles were. There are some differences, especially in size. An alternative CPU or complete system represents a much larger investment for a user than a disk subsystem.

But the competition is growing. IBM is being challenged on its home turf, mainframe for mainframe, with high stakes for the challenges. Users are watching on the sidelines, evaluating and comparing systems to see which best meet their needs.

This is still a dynamic industry, and in its relatively short life one principle has emerged: When alternatives are present, the user benefits. The heyday of the alternative system may be just around the corner.

Letters to the Editor

IBM 3033 Delivery Schedules Will Stir Marketplace Panic

When IBM announces the delivery schedules on its 3033s, panic will hit the marketplace. IBM plans to produce only 800 systems at 40 systems a month and presently has over 2,100 orders for such systems.

Will IBM expand its manufacturing capabilities to produce more systems? No! Will there be a panic to order Amdahl computers? Yes! What will happen to customers selling their IBM 3033 early deliveries at fantastic premiums? They will never see a machine from IBM.

It is expected that IBM will attempt to calm this panic by announcing the IBM 3032 on or about Sept. 15. These systems will probably reduce the 3033 customers by, at most, 400.

The problem is bewildering. Used computers will be at a premium and it appears the Japanese can take advantage of this situation through massive imports. Don't expect IBM to randomize delivery positions, as it will definitely hand-pick preferred customers.

George S. McLaughlin Jr.
Summit, N.J.

SSN Misused Once Again?

The July 25 issue of Computerworld printed an article describing a criminal wanted by the FBI ["Systems Analyst Sought by FBI for Fraud"]. While I feel CW offered a valuable public service in doing so, part of the description irritated me.

Your attempt to track a person down using his Social Security number (SSN) indicated your approval of its use as a general form of identification. I am opposed to this even where it applies to criminals.

Now you know how I feel on the subject of using the SSN as an identifier. Please publish your view.

Steven R. Seltzer

Willow Grove, Pa.

Oops! We goofed. We agree with Seltzer that the SSN should only be used for Social Security purposes. Ed.

Footnote on IBM in Nigeria

I would like to add a footnote to the letter written by Nate A. Newkirk illuminating the generosity of IBM in Ibadan, Nigeria [CW, July 11].

At that time, 1962, IBM had no installation in Nigeria, that market being shared by ICL, NCR & Burroughs. There may indeed have been only the benefit of Nigerian nationals in mind when this computer center and several scholarships were donated, but at that time, as a competitor, I did not so view the IBM action.

I would then have agreed that "15 years later IBM's investment continues to provide benefits in keeping with Watson's and IBM's original intent."

Norman J. Parkinson
North Bend, Wash.

Lord Challenge 'Asinine'

Kenniston Lord Jr.'s "challenge" to Joseph Rigo [CW, July 25] was both asinine and ludicrous.

Asinine, because he feels that merely taking an exam will change somebody's feeling about it. That is sort of like drafting somebody into the armed forces and expecting him to change from a dove into a hawk.

Ludicrous, because he thinks that people and their ideas can be bought, regardless of their founding. They pay draftees, don't they?

Andrew R. Farber
New York, N.Y.

Data Past

Five Years Ago August 9, 1972

WHITE PLAINS, N.Y. — IBM said its system 370/135s and 145s would be upgraded to include virtual storage capabilities at no charge. At the same time, the company announced the 370/158 and 168.

The firm also announced virtual storage packages for the 370/155 and 165, but those were available only for purchased systems and cost \$200,000 for the 155 and \$400,000 for the 165.

WHITE PLAINS, N.Y. — The first of IBM's four system control programs, OS/VS1, was used by the company to demonstrate the capabilities of the expanded line of 370 CPUs. Each of the control programs was compatible with the existing version of DOS or OS to avoid the conversion complications that accompanied switches from one operating system to another in the past.

Eight Years Ago August 13, 1969

NCR Corp. admitted there were problems with software designed for its Century 100, but said they were being solved. One user said, for example, that the Central Information File, a software package for banks, really required a Century 200.

NEW YORK — PL/I continued its slow march toward standardization at a meeting of the Composite Languages Development Corp. The group, a division of the U.S. Standards Institute's X-3 Committee on Computers and Information Processing, was formed to further develop the PL/I language in collaboration with Technical Committee 2 of the International Federation for Information Processing and Technical Committee 10 of the European Computer Manufacturers Association.



'What Y'all Need Is a Mite More Sheltered Environment. . .'

DPer's 'Disconnected' From Family Life?

By Jack Stone
Special to CW

As I continue to report on what, I hope, are new and interesting facets of the connection between humans and computers, I have steadfastly refrained from carrying the discussion to the rather sacrosanct quarter of personal lives.

However, I decided to make an exception for this column after having received a very thoughtful and provocative letter from the wife of a computer person. It is printed below.

This letter captures in a concise and literate way the feelings expressed to me by a number of my friends who are emotionally entangled with computer people — both with and without matrimonial status. The computer people are accused, without regard to gender, of being variously insensitive, withdrawn, callous, hard-hearted, unfeeling, introverted, inhuman, soulless, dull, unsympathetic and apathetic.

Are computer people, as a group, any more or less humanistic than any other group of professional people in America? Surely all of us have heard charges of heartlessness levied at every major professional group during recent years including doctors, lawyers, politicians, engineers, scientists and professors. Are these people properly "connected" to high standards of

humanistic conduct?

Do computer people generally develop into successful family partners? I think we have all seen good and bad marriages involving computer professionals. In my own experience, I don't believe the percentages are much different from those of the other professions. I must say, though, the marriages of my highly technical friends seem to be working out better than those of my computer systems marketing friends.

Are computer people generally "insensitive" and "unfeeling" toward other people?

I'm not prepared to say the answer is "yes" or "no," but I can say that computer people are generally preoccupied with their work. I do not conclude that computer persons are insensitive by virtue of their creative abilities, but I do believe that a combination of heavy work loads, exhausting schedules, lack of social opportunities at work and the need for intensive study outside work may tend to give the appearance of insensitivity.

Unfortunately, even the appearance of continuing apathy will force the decay in emotional relationships.

So here's the letter. I suggest you read it first for content and then for style. You may find, as I did, the letter is more of a lyrical poem than a communication to a freelance writer.

Dear Jack:

One fine day I stumbled upon your column while I was waiting for an interview in a local computer company. "Aha!" I thought. "Can this be true? Is there someone who actually recognizes there just might

The Human Connection

be an element of dehumanization in this vast, mystical computer world of ours?"

Let me tell you about my "connection" to a computer-type person and the world therein.

I'm the "human." The "connection" was marriage — you know, that state of matrimony designed (programmed) for love, children and happiness. Well it was all of these things, but Oh God, there was loneliness, too — a (computer) world of loneliness.

In the beginning there was love, not a lot of communication, but love, and soon a child, and another — and then THE JOB, a position with a large computer firm. We were moved away from family and friends to an area of computer firm people.

But that was okay then. It was exciting to explore a new place and to discover new friends. It was even a bit comforting to have neighbors

who all worked for the same company. You see, we wives would commiserate over our husbands' involvement in their jobs and the apparent indifference they had to their kids, holidays and us.

It was good therapy, that commiserating — for a while. But when I became aware that all of my "special times" — times I wanted to share — were simply "plain ol' times" to him, the loneliness became too large, too sad.

There was a Christmas, for instance, a glowing day of happy children, lovely carols and good friends. I think there was even snow, and I had such nice feelings that I suggested a glass of wine by the fire. He said, "Too late, good-night." So sad, no quiet time together to share the specialness of the day.

And the trip to San Francisco was another time. We left the kids with a sitter and flew off to this exciting city, stayed in an elegant hotel high on a hill, ate in romantic restaurants, walked along Fisherman's Wharf, through Chinatown, then up and down the streets of that fascinating city.

When we returned home, a friend asked my husband what he thought of San Francisco. He paused a moment — he often paused before he spoke — and I waited . . . (compute . . . Compute . . . COMPUTE . . . PRINTOUT!) — "Nice."

(Continued on Page 16)

IBM Trade Controversy Goes On in Australia

Firms that trade under initials are sitting ducks for "clever" sayings, and IBM is no exception. Its personnel policies were harpooned some years ago with the suggestion that IBM stood for "I've been moved." The practice of "decommitting" products and descriptions after taking orders was summed up in the phrase "I've been misled." Now, as many people in Canberra, Australia, would tell you, the letters stand for the International Business Methods of the company.

The trouble came up last month when IBM stopped selling most of its products in Australia in protest against the government-sponsored Trade Practices Act, as reported in this column last week.

Since then, matters have not stood still, but the situation is still confused. A new minister of business and consumer affairs has been appointed. The IBM managing director has met with both outgoing and incoming ministers and is reported as saying it appears the IBM contracts will not have to be rewritten (whatever that means).

What is becoming clearer, however, is that what IBM is objecting to is Australia's action to make all firms, large and small, responsible

for damages caused by "deceptive" or "misleading" conduct. As its name states, the law deals with trade practices and not trade goods.

The key sections of the act are parts V and VI. Part V outlaws "conduct that is misleading or deceptive or is likely to mislead or deceive." Part VI lets firms recover in the courts for some types of breaches of Part V, provided that all the circumstances (apparently including the proposals given, any advice supplied, etc., as well as the relative knowledge of the two firms) make it reasonable.

Under one of the many "outs" in the legislation, where a supplier draws attention to any defect or advises the customer as to what precautions he should take to check for potential defects, there appears to be no liability at all.

However, liability does exist if, for instance, in a proposal or through some other conduct IBM were to suggest an "unsafe" way of using a product with known deficiencies; or if it overstated the capacity of the system in a deceptive or misleading way.

Now, I can't see anything unreasonable or impossible with that trading standard. If a sort is liable to lose records and not report the loss and if this defect is known to IBM, then I can't see why the Australian law shouldn't hold IBM responsible for deceptive or misleading conduct.

And I certainly can't see why IBM couldn't operate under such a law

simply by cleaning up its sales practices, where necessary, in that country.

What IBM seems to want to do is to limit any potential damage award to some multiple of the price of the deceptively presented product.

At current prices, this limited amount would be trivial in any software case. And, because of the industry box-by-box pricing structure, it would probably also be trivial in the case of misrepresented hardware.

For instance, if IBM failed to point out the inadequate checking of tape reading, a multimillion-dollar data base could be destroyed, yet the damages would be limited to the multiplied price of the single tape drive concerned.

Certainly the adoption of this type of limitation would enable IBM to balance its books on an installation-by-installation basis. But it would not satisfy Australia's desire to outlaw deceptive and misleading business conduct.

ness conduct.

In fact, the size of the awards needed to change the conduct of powerful multinationals like IBM could well be much larger than this limitation would allow.

So the law is still in place. In Sydney informal expectations are that new IBM contracts will start to be accepted in late August — shortly after Parliament (which would have to approve any change in the law) reconvenes.

The former minister, J.W. Howard, goes to the European Economic Community trade negotiations with greater awareness of the problems of international trade, and Wal C. Fife steps in to oversee the situation that has developed when a sovereign nation meets up with a multinational. It will be interesting and instructive to see the outcome.

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The Taylor Report

By
Alan
Taylor
CDP



This is the Federal Parliament House in Canberra, scene of next episode in IBM vs. Trade Practices Act drama.

Adabas Said to Include Nonprocedural Code

The June 13 issue of *Computerworld* included a small item about an interface to Software AG's Adabas available with Ramis. The item incorrectly stated that Adabas does not include a nonprocedural language.

The Adabas system has not one but two nonprocedural languages. Adascript for on-line inquiry was released in the fall of 1973. Adawriter for batch report generation was released in January 1976 and enhanced in February 1977.

Also, last February Adascript+ was released to provide an on-line inquiry

and reporting nonprocedural language. All of these have been distributed to all Adabas users at no additional charge.

Thomas R. Berriford
Vice-President
Software AG
Reston, Va.

Julian Date Mapping

In reply to Don Dietrich's inquiry about why YYDDD is called a Julian date [CW, July 11], the answer is quite simple.

Under the Julian calendar February always has 28 days, so DDD can always be

mapped into the correct month and day. A Gregorian YYDDD would be erroneous in its mapping because of the variable length of February.

You would actually need a YYYYDDD format to correctly account for leap years. (Leap day is not introduced if YYYY is divisible by 100 and not by 400.)

Alexander Nesenjuk
Raritan, N.J.

Keeping an Open Mind

I suppose a program could be considered part of a mechanical device if it ap-

peared in a read-only memory. Otherwise I would think not because mechanical devices do not have parts that disappear when you turn the power off.

It seems to me that getting a patent is a long, involved, expensive process (meaning that I probably couldn't afford it) and getting a copyright is short, simple and cheap.

To me, writing a program is at least in the same category as writing adventure stories. They may or may not involve a lot of "creativity," but all have copyright protection.

Nevertheless, I will consider the suggestion that programs are in a class by themselves and, likewise, consider any suggested changes to existing laws or proposals for new ones.

It seems to me that any kind of "program copyright" law is going to be very useless unless we can find a way of enforcing it and I think that is going to be impossible.

Leigh Janes
Rocky Hill, Conn.

Another Alternative

You have recently published letters from representatives of various source library systems arguing their relative worth. Panvalet, Slick and Librarian do provide good security and they can be useful for management control, but they are not adequate for an installation that wants to raise standards of programmer productivity.

A library system is used more than any other tool. It can assist a programmer by cutting out a great deal of clerical work. Following are a few drawbacks of the well-known library systems.

Panvalet and Slick automatically resequence a program on every update. This makes it difficult to correlate different versions of a program.

Librarian and Panvalet don't recall previous versions when a program is updated. If you accidentally delete records 500-6,000 instead of 500-600, you may have an extra day's worth of work.

All three systems require corrections to be placed in ascending order.

Records cannot be copied from one place and inserted in another. This is of extreme importance both in rearranging records and in program composition.

Our library system, TXTM, has none of these shortcomings and its text manipulation language is simple and powerful. For example:

If column 10 is an "A," move columns 10-12 to 11-13.

If the character string "ABC" appears in a range of records, change the character which follows to an "X."

Joseph Sider
Joseph Sider and Associates
Encino, Calif.

A Positive Outlook

At least, with all the problems facing us in the future represented by the movie "Star Wars," we will have a standard interface.

Bill O'Connor
Rome, Ga.

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When It Comes to Ethics Golden Rule Applies to DPer Changing Jobs

By William A. Delaney

Special to CW

A recent Computerworld article discussed ethical, unethical and nonethical conduct on the part of programmers who take programs with them from one job to another and, possibly, hurt a former employer by delivering to a competitor software that was paid for and developed at the former place of employment. ["'Who Owns a Program' Depends on Type of Software," CW, June 27].

The question of ethical behavior is a difficult and very subjective one. It can sometimes depend on where you stand. If, for example, you are the employer and pay a programmer a good salary for several years to develop software, you can argue that it belongs to your company.

The programmer can be ego-involved and determine that it is his work and brainpower that developed the software. The software therefore is rightfully transferable when the programmer takes on a new position.

There is no easy solution regarding the ethical question, and no set of guidelines will ever make anyone honest. This comes from within each of us.

I suggest, however, that the following factors be considered if anyone is trying to determine whether the transfer of a program from one company to the other is ethical.

- Did the new company hire you specifically because it knows exactly what you are doing? Is it in direct competition with your present or former employer for a particular job or series of jobs? Is it more interested in specific work you are doing rather than your general experience and education?

If the answer is yes, the possibility of unethical conduct may exist.

- Did the new company ask you to bring specific programs, modules or subroutines with you? If so, be careful. The possibility of unethical or even illegal conduct may exist.

- Did you sign any conflict-of-interest statement at your former place of employment as a condition of employment?

If you did, then observe it now, even if you don't want to, because you gave your word in advance. Next time, don't give your word. Don't retroactively decide the agreement was wrong.

This is a rationalization of your behavior, because you don't want to keep your word.

- If you did not sign any conflict-of-interest agreement, you may be legally free to do what you wish; ethically, however, you may not be if you determine that bringing a program with you could damage your former employer's opportunity for business, expansion or growth.

No one can stop you on this one but your own conscience.

- If you find yourself taking program listings, printouts and other such data with you, then you may be in the area of unethical or illegal behavior. Especially if you are doing it secretly.

Ask your boss if he minds if you take it and see what the answer is. If you don't ask, watch out; you are in unethical territory again.

- You were paid every month for as

long as you worked where you worked. The employer paid you for what you did and, legally, the result of your work belongs to the place that paid you to develop it.

When a carpenter is paid to build a house, he doesn't own it when it's done. Consider software in the same way.

- Ask yourself the following question: Would you approve of an employee doing what you plan to do if you owned or represented the company or organization for which you work or formerly worked? Then act accordingly.

If still in doubt, ask a qualified third party. (That's one of the jobs for

clergymen, if you would care to discuss it with them, and it is guaranteed to be confidential.)

Don't ask relatives or friends — they won't be objective. They will tend to

Reader Commentary

agree with whatever you say on the subject.

Trying to see it that way may help solve some questions of ethics. No one can stop you using your experience, education or training on a new job, and

this is easily transferrable from one job to another. Indeed, that is what employers want when they hire experienced personnel.

If, however, in addition to taking copies of programs to your new job you use them very soon, and relatively unchanged, then be careful because this could constitute unethical conduct.

"Do unto others as you would have them do unto you." You can't miss if you use this rule, and it is easily transferrable from job to job.

Delaney is president of Analysis and Computer Systems, Inc. in Burlington, Mass.

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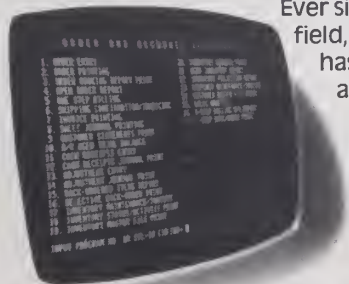
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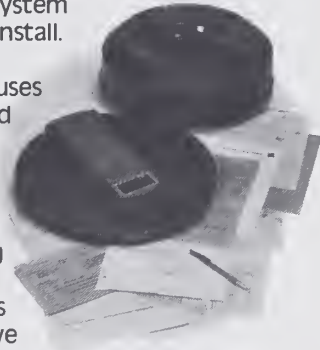
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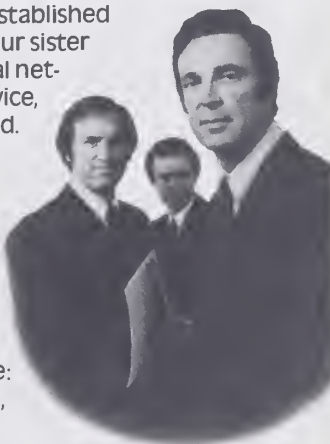
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Constructive Criticism of NCC Welcomed

By Dr. Roger M. Firestone
Special to CW

As a member of the Program Committee of the 1977 National Computer Conference, I am writing in response to the letter from W. Thad Lee [CW, July 18].

Lee complained about the lack of parking, the lack of access to sessions for handicapped attendees and the crowding at certain sessions.

It is difficult to attach blame to the American Federation of Information Processing Societies (Afiaps) for the lack of parking space in downtown Dallas; certainly few people expected to find parking readily available in Chicago in 1974.

Unlike Chicago or New York, however, free transportation was available to conference attendees which, it was hoped, would reduce the need for parking.

Regarding architectural barriers to the handicapped, it was unfortunate the program booklet did not include the customary map of the convention center, which would have indicated the location of elevators. Perhaps they should have been marked clearly.

One elevator for passenger use was available just off the registration area, and it did receive frequent use.

I am confident further attention will be given to this area at future NCCs; the fact that buildings constructed prior to current federal

guidelines on handicapped access must still be used will impose some limitations on how much improvement can be made.

As it was I who made the room assignments for the NCC, I must accept full responsibility for the problems and difficulties which resulted.

Room assignment is a difficult task. Having been a session chairman and speaker as well as an attendee at prior NCCs, I am aware of the many frustrations that improper room size can produce.

Lee should recognize that placing a session with 30 to 50 attendees in a room with capacity of 600 can be very damaging to a speakers' ego and equilibrium; additionally, it may discourage attendees from asking questions.

Room assignment was undertaken with only a limited number of rooms available for assignment. It was desired to achieve a physical grouping of session "tracks" with similar themes.

This indicated that the use of the theater building was not suitable for technical sessions; instead, it was used for personal computing sessions and some exceptionally large sessions.

Moreover, the professional development seminars were allocated some of the larger rooms; that they sold out to capacity indicates this was desirable and necessary. Others of the larger rooms were

needed for exhibit registration and similar administrative purposes.

Past experience has shown the most technical sessions have usually had the smallest attendance

theater was available for reassignment.

Note that the ratio between the largest and smallest sessions on the tracks in question exceeded 60. The resulting problems should be obvious.

Best Ever

In many ways, the Dallas NCC was indeed the best ever for the largest number of people ever. Seldom will any enterprise of this size be run entirely without difficulties.

This year's steering committee is anxious to receive constructive suggestions of how improvements might be made in next year's conference. I am sure constructive criticism would be welcomed.

Reader Commentary

because of their specialized nature. In this year's program, the technical tracks were assigned to smaller rooms for this reason.

However, the technical tracks also included some very popular speakers (Herb Grosch, Gene Amdahl and Ed Yourdon, to name a few) and two sessions were moved to accommodate crowds when the

Are DPers Disconnected?

(Continued from Page 13)

Oh God, nice, NICE, was that all? That beautiful pastel city on a hill where the mist stole in each evening to the call of the fog horn. The feeling of romance was, I thought, everywhere in the lights of the night. And he said, "Nice."

What happens to a man's awareness of the sights and sounds of LIFE? Were they ever there, or were they lost somewhere in that damn computer which has no capacity to feel — or to love?

I don't know. Perhaps it's the inherent nature of the computer man — precise, exact, logical. It's true, San Francisco was nice, after that long Christmas day it was sensible to go to bed, and the sights and sounds are subjective, and so is love — thank goodness.

It's okay. This "human" has been "disconnected."

I'm glad you're writing about humans.

Painter Hoffman
Bethesda, Maryland

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Reader Finds Reaction Confusing

Both Stone, Tannenbaum Have Good Points

By H. Andrew Shirley

Special to CW

I read with great interest Jack Stone's July 18 reply to Saul Tannenbaum on the question of professional ethics in training Iranian policemen in computer technology — and I discovered an amazing reaction on my part.

As I read Tannenbaum's letter, I felt sincere empathy with his point of view. At the close of his remarks I wanted to run up the stadium steps waving an American flag and shouting slogans about human rights.

Then I read Stone's reply and found I could relate nicely to his arguments for conducting the training program as he had.

To say the least, I was perplexed at my confusion about what I really felt and believed about this important issue.

I began contemplating the situation and determined that I agreed — and disagreed — with both men. Tannenbaum raised a very relevant question for today's DP community, but his approach seemed to be very idealistic. Although ideals should certainly be as high as possible, reality often dictates a different tune (it's like those TV commercials aimed at the "typical American" — there just ain't no such critter).

Tannenbaum's concern is commendable and I hope he continues to maintain his apparently high degree of integrity, but no father is going to deny his hungry child bread because he doesn't like the way the baker parts his hair. Instead, he might try convincing the baker to change his hairstyle.

As for Stone, given the same set of circumstances I

would have done as he did — forge ahead with the training program. However, I have the impression, and perhaps erroneously, that Stone believes he is not his brother's keeper.

Professional ethics sometimes walks a very thin line

ment Stone questioned whether he should become a committee of one and "rock the boat" when everyone else seemed content to stay seated.

I don't know Stone's religious preference, but I would recommend he read

as well hide away in a cave. But when we do speak out, we find others around us also crying out and presenting a unified front.

Stone's reasons for doing what he did seem valid to me; our government does have a friendly policy toward Iran and it is true someone else would have done the work if Stone's organization had not.

However, I wonder if Tannenbaum's original question of unethical practices is closer to the truth than Stone thinks, but for entirely different reasons.

The DP community needs to be concerned about privacy legislation, human rights and professional ethics and it needs to take a realistic approach to these issues, but hiding one's head in the sand is no more realistic than trying to ride a rainbow.

Shirley is DP manager of Mulberry Construction Co. in Mulberry, Fla.

Reader Commentary

where a mere change in attitude can spell the difference in what's ethically right or wrong. Maybe Stone was only miffed over what he took to be grave and serious accusations, but whatever the motive his rebuttal reeked of callous indifference which, in my opinion, stood on the brink of being unethical.

To kill a sick animal because he's sick is one thing, but to kill a sick animal because you like killing... I think you see my point.

At the close of his state-

the story of Elijah in the Bible (I Kings, Chapter 19), where the Lord demanded to know why Elijah was hiding in a cave when he should be out taking a stand for God. Elijah's answer was, in effect, that he was a committee of one and there was no use trying. The Lord then replied that this was not so, there were 7,000 more of whom Elijah knew nothing.

The application is clear. If each one of us refuses to rise and be counted on an individual basis, we might

Value of Software Copyright Lies in Incentive to Create

By Jonathan Sachs

Special to CW

Author John Hersey has argued that copyright protection is inappropriate for computer programs because a program is a "mechanical device, which is engaged in the computer" [CW, July 4]. I am not convinced.

To accept this argument, we must strain the concept of a "device" beyond its usual limits — an effort which is awkward and unnecessary.

The Supreme Court used

Hersey's argument in 1908 to deny copyright protection to musical compositions that were pirated by a piano roll maker (White-Smith Music Publishing Co. vs. Apollo Co.). Congress promptly incorporated such protection in a revision to the copyright law.

Recording of copyrighted music has been regulated by the law ever since, and neither the law nor the recording industry has suffered.

A program that is installed on a computer is nothing "strikingly new in our culture," as Hersey contended. It is not essentially different from music on a phonograph record — or a piano roll.

The problems of imitation, transaction charging, networking and so forth all have analogues in the recording and broadcasting industries. We are dealing with problems that have

been solved before, and we need not resolve them from scratch.

Copyright and similar protection is a legal "monopoly license" designed to ensure creative people receive a fair reward for their efforts and so give them an incentive to work. It is settled law that the protection should be broad enough to accomplish this purpose — and no broader.

The program protection issue is therefore basically economic: What protection is needed to ensure that programming develops vigorously, as an art and an industry? Hersey's arguments about what a program "is" are off the point.

I believe that copyright protection is quite adequate for computer programs. No major innovations are necessary.

Sachs, trained as an attorney, is a freelance writer in San Carlos, Calif.

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'Midas' Controls Add to DG's RDOS

NEWTON CENTER, Mass. — The Management Information Data System (Midas), created by Management Techniques, Inc. (MTI) to simplify operations on full-sized machines, has been adapted to the Data General Corp. RDOS environment, providing users with facilities not available from DG, according to MTI.

Under Midas, all the functions of the system are performed by control programs invoked by operator-entered commands. The ultimate goal of the Midas development is to support "operatorless, programmerless, skill-less data processing," a spokesman explained.

The current Midas provides three levels of protection for the user, he claimed. A log-on procedure, for example, prevents unauthorized users from gaining

access to the system in the first place, he said.

Although Midas has the ability to support many commands, installations often wish to limit the number and type of instructions available to their operators. A "profile" routine screens incoming commands against a user-defined list of acceptable ones, processes those that are valid and blocks those that are not.

Finally, the system has the ability to monitor runs, tracking successful execution of predecessor runs before allowing the current work to get under way but stopping execution if prior work remains to be done.

Also built into Midas, the spokesman claimed, is a facility for storing strings of commands — including conditional branches — for execution upon later entry of

a single routine name.

Midas runs in 16K under RDOS on any DG machine which supports that operating environment. The MTI software is available for \$1,000 plus \$10/mo maintenance or as part of the cost of various application programs also available from MTI.

MTI is at 28 Tanglewood Road, Newton Center, Mass. 02159.

'Culprit' Eases Formatting

WELLESLEY, Mass. — Release 4.3 of the Culprit Output Processor package from Cullinane Corp. is said to provide automatic report formatting and an extended macro facility to ease coding and simplify report alterations.

The Automatic Header Generation supports three forms of column labelling: posting the predefined field name; posting a literal, but leaving placement up to the user; and posting a literal which the system always associates with defined fields, a spokesman said.

The Info-Column Specification feature allows the user to leave the positioning of columns across the page up to the system. This facility can be combined with the Automatic Header Generation or used independently, he added.

Release 4.3 extends the previous COPY facility that allowed users to combine sections of existing code to form new report specifications. With the update, users can delete or resequence specified parameters, change

print formats or alter logic to produce new reports without coding entirely new parameters.

The enhanced Culprit also supports floating dollar sign specifications and user edit masks that perform a range of functions including zero suppression, decimal point insertion and negative value specification.

Culprit can be used in any IBM 360/370 environment from DOS through OS/MVS. It requires a minimum partition of 64K bytes to handle two or three reports under DOS.

The basic package costs \$20,000 plus 10% each year for maintenance after the first year. The features in Release 4.3 are included in the various specified versions of Culprit as well, Cullinane said from 20 William St., Wellesley, Mass. 02181.

Special Modules Extend Fixed Asset Accounting

SANTA CLARA, Calif. — Construction in progress, asset maintenance and leased asset reporting are capabilities included in an enhanced version of the Fixed Asset Accounting System now available from Data Design Associates, according to a spokesman.

The base system, written in ANS Cobol and implemented on a wide range of hardware, sup-

'Mark IV' Version Handles EEO Jobs

WOODLAND HILLS, Calif. — The 43 standard reports available with the Mark IV/EEO & Affirmative Action Reporter package from Informatics, Inc. are said to incorporate all aspects of compliance reporting requirements, from evaluation of workforce composition to comparisons of external labor markets.

A basic Mark IV system and the EEO Report module cost \$21,000; current users of Mark IV can get the module by itself for \$3,700.

Informatics is at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

ports book and tax depreciation accounting, the federally sanctioned Asset Depreciation Range reporting and the Securities and Exchange Commission's Replacement Cost Accounting, he noted.

In addition to its newly available property accounting capabilities, the package includes a user-controlled report writer feature. This gives users an expanded level of flexibility in building their property data bases and extracting reports in any desired format, the spokesman stated.

The software runs in 64K bytes. It has been installed on IBM, Burroughs, Honeywell, Univac, Data General and Hewlett-Packard systems and efforts are under way to include Digital Equipment Corp. and NCR equipment, he added.

The base package costs \$12,500, but typical configurations are higher than that, depending on which of the specialized modules are selected.

Data Design Associates is at Suite 418, 1333 Lawrence Expressway, Santa Clara, Calif. 95051.

'QShare' Aids Spooling

GREAT NECK, N.Y. — QShare from Labyrinth Systems Ltd. is an enhancement to the Power/VS queues spooling software supplied by IBM that allows multiple CPUs in a shared environment to access the same Power/VS and data files.

Although each CPU in the configuration must have a memory-resident copy of Power/VS to utilize QShare, each need not have its own reader, punch, printer or other "unit record" devices, according to a Labyrinth spokesman.

The Labyrinth package can locate the next available device of the type needed and route the job to it, even if it is not attached to the CPU that initiated the job, he

said.

On the other hand, attaching all unit record devices to a single CPU optimizes the effectiveness of QShare by eliminating its need to search through other systems for available peripherals, he added.

The ability to match available devices to current work requests may improve throughput performance as well as save the cost and space requirements of equipment which might be unnecessary with QShare in place, Labyrinth said.

A perpetual license for QShare costs \$7,500. Lease and rental agreements are also available, Labyrinth said from 17 Barstow Road, Great Neck, N.Y. 11022.

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Picking a Winner — Part I

Technicians Alone Should Not Select DBMS

By Robert B. Chamberlain

Special to CW

An idea currently prevalent is that selection of a data base management system (DBMS) is rather exclusively in the purview of an installation's senior technical personnel — those honchos and near-honchos who possess an almost mystical combination of arcane knowledge about the shop's current application systems and well-honed analytic skills regarding state-of-the-art software.

I believe giving these "phenoms" DBMS selection powers (with perhaps the sop to user departments of having an onlooker present with the right of free speech) is somewhat akin to leaving the fox in charge of the henhouse.

The issue is not the adequacy of the analysis of a package's technical credibility, but rather the stress put on that aspect of package selection and whether proper planning

has been done prior to the technical evaluation of a package — in other words, whether such data base amenities as a proper information flow analysis (IFA) and service analysis have been observed [CW, May 23, 30].

The performance of such essential preselection and preinstallation activities will, if done with a proper commitment, sufficiently involve key individuals from user departments to the point where they will have gained insight into data base in philosophy and practice and, by virtue of their involvement, have contributed key input to the package selection process and therefore have become an integral part of the process.

Lukewarm user involvement only brings a token commitment of the user representative. The old cry, "I tried to tell them but they wouldn't listen to me," is guaranteed to come up at the first sign of a crunch (and some crunch is historically inevitable).

'Vested Interest'

Relying on senior technical people as experts on current applications creates a "vested interest" problem. This problem arises not from a failure to

completely understand the present system, but from a reluctance to fully appreciate the possibilities inherent in a new one.

This reluctance, in turn, comes from a desire to protect a position of expertise (job security, in other words) and from another natural human tendency, that of re-creating the known in preference to doing the unknown.

In data base terms, this means the conversion of existing systems to DBMS systems instead of a data base-oriented redesign of existing systems. A foot-in-the-door to the conversion approach can come from an approach which says, in effect, "We in DP know the system, so why bother the user by asking questions about what he needs."

User Excluded

The user has now been effectively excluded from the problem-defining environment (in our data base terms, an IFA and service analysis), an action which guarantees his exclusion from the problem-solving environment (data base file design and DBMS package selection).

It should be observed that there is no advocacy here of

having underwriters and loan officers evaluating recovery/restart capabilities and speaking knowingly of inverted files and ring structures. That sort of technical evaluation does belong properly to the best of the DP staff (perhaps

would entail both time and money.

It is highly unlikely this decision could be made in a vacuum by Personnel Department staff alone. It is furthermore unlikely Personnel could unilaterally make a formal recommendation without a give-and-take with user departments regarding the logic of the various solutions and their impact upon the user and his current and future requirements.

Point of Absurdity

And it is even more unlikely, to the point of absurdity, that Personnel would claim that it alone had the real truth and right of possession to personnel data.

Yet this same type of thinking is not uncommon in DP, both in its everyday working and in its data base package selection process.

In his next article, Chamberlain will discuss a "political solution to a political problem — the selection of a DBMS."

Chamberlain is a senior consultant, information systems, with CACI, Inc. — Commercial, New York, now on assignment in Europe.

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Course Details Report Writer Use

KANSAS CITY, Mo. — Students completing the ANS Cobol Techniques/Report Writer course module from The Edutronics Group can decide when conventional report processing should be used instead of the Cobol Report

Writer feature.

Intended for DP managers who need an overview of the features's capabilities and limitations and for programmers and operations personnel who may need to produce "quickie" reports, the course should take three hours, depending on the skill level of the user, a spokesman said.

The course shows that most printed reports have certain elements in common and that there is an inherent logic to using a generalized routine such as Report Writer.

It shows how to use the Cobol feature but, through example, the course also shows when special needs make the

Infonet Installs Modeling System

EL SEGUNDO, Calif. — Sciconic, a mathematical programming system developed by Scicon Computer Services Ltd. of England, is now available on Infont, Computer Sciences Corp.'s (CSC) time-sharing service.

Working with a unique high-level language, the Sciconic user can find an optimum solution to a problem having millions of possible answers, CSC claimed.

CSC is headquartered at 650 N. Sepulveda Blvd., El Segundo, Calif. 90245.

generalized approach inappropriate, he noted.

The training program is available under Edutronics' library lease plan. It can also be purchased for \$390, from 3435 Broadway, Kansas City, Mo. 64111.

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Systems Seminars Set

WELLESLEY, Mass. — A five-day seminar on business systems analysis and design will be held in Nashville, Tenn., late this month and repeated in Toronto, Seattle and here in Wellesley later.

Sponsored by Honeywell Information Systems, the course should be useful to systems analysts, programmers, staff technicians and user department personnel, no matter what kind of DP equipment they have available, an HIS spokesman said.

The course shows how to develop and design systems. Lectures present an approach and workshops give "hands-on" experience using it.

The course costs \$395/person, according to HIS's manager of educational services, 110 Cedar St., Wellesley, Mass. 02181.

More RJE Support, Too

Sycor Adds Basic for 440 Systems

ANN ARBOR, Mich. — Sycor, Inc. has introduced Basic for use on its 400 series of distributed data entry/processing systems. The newest of Sycor's languages provides users with mathematical and problem-solving capabilities generally associated with time-sharing computers, a spokesman noted.

At the same time, the com-

pany also introduced Burroughs Remote Job Entry support for its 440 distributed data entry/processing system. This provides Burroughs users a means of accessing peripherals unique to the Sycor system as well as devices with which they may be more familiar, he added.

Sycor Basic supports both sequential and direct-access files, all of the common

algebraic operators including arithmetic and relational symbols, concatenation and Boolean logic capabilities, Sycor said.

Exponents to the power of +38 or -39 are provided, while three-dimensional arrays are limited by available memory. Floating-point, single-precision numbers may be up to seven digits, the spokesman added.

On a more scientific side, Sycor Basic supports the trigonometric functions — including sine, cosine, hyperbolic cosine and others — as well as logarithms and square root, he said.

Even while a 400 series processor is operating in Basic, data entry applications can be operating through other keyboards, he added.

The Basic software will be available for a one-time charge of \$750 in the fourth quarter of the year, Sycor said.

The Burroughs support will be available for customer use by the end of next month, the company stated.

CDC Disks, DOS/RS Now on 360

PARK RIDGE, Ill. — Users of IBM 360/50s or 65s running under Dearborn Computer Co.'s DOS/RS operating system can now include Control Data Corp. 38301/33301 disk subsystems in their configurations, according to a Dearborn spokesman.

A joint development effort by CDC and Dearborn has made it possible to attach the 38301 controller to the IBM selector channel, with the 33301s — equivalent to IBM's 3330-1 disk drives — then cabled to the controller, he said.

The CDC 38301 microcode has been extensively modified to handle the 360 selector channel times instead of the 370 block multiplex channel times for which the controller's code was originally designed. The microcode changes are available from Dearborn on a floppy disk, the spokesman noted.

Programming added to DOS/RS to handle the CDC peripherals increase the memory requirements of the operating system by about 1,400 bytes, he said.

Version 6 of DOS/RS, currently available, costs \$13,750. Version 7, which will include 10-partition support, is scheduled for delivery at year-end and will cost \$19,750.

Dearborn is now located at 1460 Renaissance Drive, Park Ridge, Ill. 60068.

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DDS Rates Filed to Boost Users' Bills 5%

By Ronald A. Frank
CW Staff

WASHINGTON, D.C. — AT&T has filed new rates for its Dataphone Digital Service (DDS) that would increase users' bills an average of 5%.

The proposed higher rates were filed with the Federal Communications Commission (FCC) here to be effective Oct. 23 if approved by the commission.

The rates were filed in response to an FCC order which required Bell to cover the costs of providing DDS in the rates it charges to users. The FCC order was issued after the commission determined DDS rates were too low.

DDS is a digital service for data communications users that is available at transmission speeds of 2,400-, 4,800- and 9,600 bit/sec, 56 Kbit/sec and 1.544M bit/sec in 24 metropolitan areas.

The effect of the proposed rates will be to increase costs for short-haul, low-speed users while decreasing costs for

long-haul, high-speed users, according to an AT&T spokesman.

The rates filing was the second of a two-step response to the FCC order that AT&T has undertaken to bring DDS rates in line with the cost of providing the service. In March, AT&T implemented "interim" DDS rates which were an average 20% higher than the tariffed charges in effect at the beginning of 1977.

Under the latest rates, a customer operating between New York and Chicago faces both increased and decreased costs at the lower DDS speeds. At 2,400 bit/sec, the January rate was \$476.92/mo; this would jump to \$509.24/mo.

At 4,800 bit/sec along the same route, the old rate was \$688.44/mo while the new rate would drop to \$674.64/mo, AT&T said.

At higher speeds and distances, users would benefit from rate reductions. From New York to Los Angeles at 9,600

bit/sec, the old rate was \$2,591/mo while the proposed rate would be \$2,273/mo. At 56 kbit/sec, the old rate was \$10,647/mo while the new rate would be \$8,666/mo, AT&T said.

Rates at 1.544M bit/sec remain unchanged.

The interim rates now in effect represent a 20% increase over the rates in effect last January; the latest rates are 5% higher than the January rates. As a result, the proposed rates should average about 15% below the interim charges, the AT&T spokesman said.

Users and other parties interested in commenting on the proposed DDS tariff should respond to the commission's Common Carrier Bureau by Aug. 19. The bureau is currently analyzing the AT&T proposal, an FCC spokesman said.

No decision has yet been made on whether the commission will approve, reject or suspend the rates pending a regulatory proceeding.

Raytheon Extends PTS/ 1200 Downline

NORWOOD, Mass. — Raytheon Data Systems Co. has introduced a software enhancement for its PTS/1200 line of distributed systems which it said permits users to extend six capabilities of those systems to smaller remote locations within distributed networks.

PTS/1200 systems with the downline terminal support enhancement reportedly allow users to perform source data entry and preprocessing, file and record maintenance, unattended two-way communications, stand-alone batch processing, report printing and interactive transactions with a host mainframe in IBM 3270 emulation.

With the capability, users can install PTS-100 programmable terminal configurations in smaller offices which may function as satellites to the PTS/1200 site, according to Raytheon.

The downline keyboard/CRT terminals connected to PTS-100 control units can operate in emulation of IBM 3270 equip-

Prentice Upgrades Speed of SLD

PALO ALTO, Calif. — Prentice Corp. has enhanced its synchronous line driver (SLD) to a maximum speed of 28.8 kbit/sec.

The enhanced switch-selectable SLD 28.8(M) is capable of transmitting data up to six miles over nonloaded cable, the company said.

With its multiple data rate, IBM users can upgrade from 2,400- to 4,800-, 7,200-, or 9,600 bit/sec, Prentice noted.

The SLD incorporates diagnostics including local and remote loop-backs, nine LED indicators and pseudorandom word generation for self-testing, the company added.

A rack-mount version of the high-speed SLD costs \$790, according to Prentice at 795 San Antonio Road, Palo Alto, Calif. 94303.

ment, a spokesman noted. Normally, separate communications lines between those PTS-100 configurations and a host mainframe would be needed to tie smaller offices into a distributed computing network, he said.

Data is transmitted and received between PTS-100 control units and the host PTS/1200 controller at speeds up to 4,800 bit/sec under IBM Binary Synchronous Communications pro-

col, the company stated. Data transmitted from PTS-100 controllers is typically stored in the PTS/1200 and forwarded to the mainframe when necessary at 9,600 bit/sec.

The PTS/1200 controller handles communications between its PTS-100 systems and the mainframe; programs written for local PTS/1200 terminals in Raytheon's Macrol programming language can be modified for

communications with remote PTS-100 terminals, the spokesman said.

There is no charge for the downline terminal support software; the modem adapter needed to link a PTS-100 to a PTS/1200 is available for \$21/mo. The enhancement will be available in the fourth quarter from Raytheon at 1415 Boston Providence Tnpk., Norwood, Mass. 02062.

AT&T Links Non-Bell Units to TNS

NEW YORK — An AT&T plan to enhance its DP-oriented Transaction Network Service (TNS) in 1978 will allow users of the communications service to attach non-AT&T automatic teller and point-of-sale terminal devices.

The enhancement is an interface designed to support character-polled terminals.

The NCR Corp. Model 279 financial teller terminal is the first independent device selected for use on TNS, which is operational in Washington through Pacific Northwest Bell and also in Minnesota, according to an AT&T spokesman.

TNS was developed to meet the needs of high-volume, short-message inquiry/response applications. It offers network and message control and low error

rates with two methods of terminal access — dial-in and polled, the spokesman said.

The dial-in mode accommodates Bell Touch-Tone telephones, Transaction I and II telephones and compatible customer-provided equipment.

The polled access mode accommodates the Bell Transaction III terminal and customer-provided equipment using the same protocol.

The enhancement should keep the cost of using TNS the same as it has been since operations began at the end of last year, according to the spokesman.

There is one exception, however, because compatible terminals must be four-wire devices. If they are not, the additional expense for an extra two-wire loop is about \$10- to

\$15/mo, he noted.

Bell's TNS may be expanded to other states, according to the spokesman. That will depend, however, on the particular Bell company in each state and whether users find the service attractive, he added.

Vadic Introduces Registered DAAs

MOUNTAIN VIEW, Calif. — Vadic Corp. has brought out two Data Access Arrangements (DAA) which have been registered under the Federal Communications Commission's (FCC) long-form Rule 68.

The single-channel VA851 and the dual-channel VA852 have transmit-level control circuitry which continuously monitor each modem's output level, Vadic said.

If the output exceeds the programmed level, the circuit automatically reduces the level to protect the line. An LED simultaneously provides an indication of that situation to alert the operator, Vadic added.

All circuitry is mounted on a printed circuit board which occupies two slots in a standard Vadic chassis.

The VA851 costs \$135 and the dual-channel VA852 is priced at \$215, Vadic said from 505 E. Middlefield Road, Mountain View, Calif. 94043.

HIS Sets Four-Day Courses

WALTHAM, Mass. — Honeywell Information Systems, Inc. is offering a number of four-day programs on the subject of data communications intended for programmers, analysts, designers and managers of small/medium systems.

The courses are designed for the user evaluating or planning a system using data communications, whether or not Honeywell equipment is used, according to a HIS spokesman.

The first course is scheduled for Aug. 22-25 at the HIS offices in Cincinnati. The courses will also be held in New York City Sept. 19-22; in Minneapolis Oct. 17-20; in Columbia, Md., Nov. 14-17; and in Detroit Dec. 12-15, he said.

Participation in each seminar costs \$395. Further information can be obtained from Dave Cook, HIS' manager of educational services, at 110 Cedar St., Wellesley Hills, Mass. 02181.

DTC Raises Dumb Devices' IQ

CAMPBELL, Calif. — Data Terminals and Communications (DTC) has a compact computing system that can make any Ascii terminal an intelligent device, according to the firm.

The Microfile combines an Intel 8080A microprocessor with one or two dual-floppy disk drives to give up to 1.2M bytes of on-line storage and up to 56K bytes of random-access memory (RAM); DTC Extended Basic software is also available.

A terminal used with the system can interact through an RS-232 interface with either a host time-sharing system or a

second terminal at speeds from 100- to 9,600 bit/sec, according to DTC.

Standard Software

Standard software includes a text editor. Also included are mailing list maintenance and an automatic letter writer.

Prices start at \$4,595 for the Model MK IIA with the single-drive dual floppy and at \$6,750 for the MK IV with two dual-floppy drives, each has 8K of RAM. Extended Basic is a \$500 option.

DTC is at 1190 Dell Ave., Campbell, Calif. 95008.

Omron CRT System Has Floppy Disk Unit

SUNNYVALE, Calif. — Omron Electronics, Inc. has unveiled the Model 8035, a stand-alone CRT terminal system based on an Intel Corp. 8080 microprocessor and featuring a floppy disk subsystem.

The intelligent terminal system includes an IBM 3740-compatible dual-floppy disk providing up to 4M bits

of auxiliary data storage and allowing generation of a library for program loading, according to the firm.

System functions are held in random-access memory from 20K bytes in the basic Model 8035 to an optional 65K and are under control of the floppy disk operating system, Omron stated.

The operating system software package consists of an assembler, editor and debugger as well as file management routines to handle file creation, deletion and modification, Omron said.

Utility programs which are

Terminal Transactions

said to enhance operating simplicity are included in the floppy disk subsystem package.

Because the terminal system offers programmability, the 8035 can be used for application-specific program development, Omron claimed.

These programs optionally can be translated into firmware-based custom terminal designs by Omron and manufactured in quantity, it added.

The terminal system can transmit data at speeds up to 9,600 bit/sec. It comes with a CRT, alphanumeric keyboard with separate numeric and function-key pads and an RS-232C interface.

Optional peripherals, such as a 120 char./sec printer, can be added to the terminal system which costs \$7,200 from Omron at 432 Toyama Drive, Sunnyvale, Calif. 94086.

AJ Boosts Speed Of Teleprinters

SAN JOSE, Calif. — Anderson Jacobson, Inc. (AJ) has a 1,200 bit/sec full-duplex option for its AJ 860 and AJ 860/A desktop printer terminals.

Option 860/120 permits either unit to operate at line speeds of 1,200 bit/sec in full-duplex mode over leased lines or the switched network, according to a spokesman.

Terminal buffer overflow protection for both terminals is provided through the use of the off/on Ascii control code sequence, the company added.

Either teleprinter equipped with the option can also operate at 10-, 30-, 45-, 60- or 120 char./sec.

Option 860/120 costs \$400 and will be available in the fourth quarter from AJ at 521 Charcot Ave., San Jose, Calif. 95131.



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Bits & Pieces

Burroughs Adds Mainframes To B3800 Medium-Scale Series

By Frank Vaughan
CW Staff

DETROIT — Burroughs Corp. has added two models to its B3800 medium-scale mainframe series.

The B3834 and the B3835 share the same 4MHz CPU, according to a spokesman. The additions to the line are equivalent in power to the B3830, the B3834 differing in that it is limited to 500,000 bytes of memory and 32 I/O channels as opposed to the 3830's 1M byte and 40 I/O channels. The 3835 differs in that it uses a more advanced memory technology requiring less space and lower costs, the spokesman explained.

The memory technology featured in the B3835 is 4K bit/chip metal oxide silicon (MOS). The 4K technology provides for a reduction of up to 25% in floor space for the system as opposed to other B3800 systems, he claimed.

Both systems are object code-compatible with all other Burroughs medium-scale systems and programs can be run with no re-compilation necessary, he said.

Peripheral interface requirements for the two systems are the same as for other Burroughs medium-scale systems, the spokes-

man said. Both systems utilize an I/O subsystem which offers a Data Link processor for each channel. The processor cycle times vary with the peripheral, and channel transfer rates up to 4M byte/sec can be attained, he explained.

Memory access time on the systems is 500 nsec for every two 8-bit bytes.

A basic B3834 features 100,000 bytes of error-correcting, 1K bit/chip memory expandable in 50,000-byte increments to 500,000 bytes. The system comes with 16 I/O channels expandable to 32 channels. Equipped with operator display and console, the system costs \$231,320 or \$5,275/mo on a five-year lease. Lease prices include maintenance, the spokesman explained, noting the system is available for immediate delivery.

The B3835 in a basic configuration comes with 16 I/O channels expandable to 40 channels. It features 500,000 bytes of 4K bit/chip memory expandable to one million bytes. The system, with operator display and console, costs \$317,560 or \$7,550 with maintenance on a five-year lease. First deliveries are scheduled in the first quarter of 1978, the spokesman said.

Hand-Held Unit Scans OCR-Imprinted Tags

DAYTON, Ohio — A hand-held scanner which reads prices and other information printed in an optical character recognition (OCR) font on merchandise tags in retail stores is available from NCR Corp. here.

The NCR 7867, a six-ounce pistol-shaped device, is immediately available as an option with the NCR 280 and 250 systems. It will be available for the NCR 255 and 2151 systems in the future, according to a spokesman.

Users can specify the type of format used on merchandise tags by filling out a specification sheet, the spokesman said. The unit is then delivered with a programmable read-only memory chip which incorporates those specifications, he said.

The scanner costs \$1,500 and is available in both U.S. and international versions.

Memory Map Runs CP-V System

IRVINE, Calif. — A CPU enhancement from Telefile Computer Products will permit Xerox Corp. Sigma 5 users to process CP-V and CP-R software, a Telefile spokesman claimed.

The Telefile T8215 Memory Map is supplied as a package consisting of three logic modules, a diagnostic program tape and a Telefile CP-V starter tape. All memory map hardware is mounted inside the Sigma 5 CPU cabinet, the spokesman said, noting a limited number of internal writing changes are also required, but these adhere strictly to the Sigma 5 logic-loading specifications.

The memory map costs \$18,200 from the firm at 17131 Daimler St., Irvine, Calif. 92714.

Reader Creates Dry Prints

ST. PAUL, Minn. — A compact microfiche reader/printer that produces dry-silver prints from fiche produced from source documents or by computer output microfilm (COM) systems is available from the 3M Co. here.

The 800 reader/printer produces a print in 10 sec, a spokesman said. It creates prints of 8.5- by 11 in., 11- by 8.5 in. and 8.5 or 11 in. square.

The 800 reader/printer costs \$1,336 from 3M at P.O. Box 33600, St. Paul, Minn. 55133.

Self-Sharpening Burnisher

Devices Clean, Certify Tapes

WOODLAND HILLS, Calif. — Two products, a tape winder/cleaner and a winder/cleaner/certifier, have been introduced by Data Devices International, Inc.

The series 310C winder/cleaner features a self-sharpening multicontact burnisher which cleans the oxide surface of tapes. Two rolls of continuous-filament cleaning fabric remove dust attracted to the reel by static electricity, a spokesman said.

The series 310C is available in versions to handle .5-, .75-, 1- and 1.5-in. tapes. Winding control permits tape to be cleaned and wound at between 300 ft/min and 1,200 ft/min. The unit sells for \$4,995.

The series 330 winder/cleaner/certifier retains many of the features of the series 310C, the spokesman claimed. It uses separate, three-channel ferrite record and reproduce heads. The erase head erases the full width of the tape, he said, noting the head life is 3,000 hours at certify speed, the

equivalent of 12,000 reels of 14-in. tape.

The unit's three-speed system operates in a bidirectional mode with either automatic or manual control.

The unit sells for \$10,950 from the firm at 6301 DeSoto Ave., Woodland Hills, Calif. 91367.

Paper Feeder Bows

HAYWARD, Calif. — Qume Corp. has introduced a paper feeder for its daisywheel printers. The feeder will enhance the output of printers in word-processing and DP systems, the firm claimed.

Qume's Speedfeed is an add-on device that inserts fresh paper and removes typed documents while under control of the user's system.

The unit sells for \$1,390 and OEM quantity discounts are available from the firm at 2323 Industrial Parkway W., Hayward, Calif. 94545.

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SYSTEMS & PERIPHERALS

Merged Technologies — Part 3

Use of COM in On-Line System Reduces Cost

By William McCullough
And Frank Malabarba
Special to CW

To address the true cost of an on-line information system, many individual components must be examined and costed out.

In addition, the characteristics of these components adds a degree of difficulty to the costing process: therefore, it is

impossible to present a one-line picture of cost.

There are endless varieties of terminals, from Teletypes to intelligent terminals, costing \$700 to over \$10,000, or \$30- to over \$300/month. Phone lines costs can be long-distance rates, Wats lines at a flat rate for unlimited usage or dedicated leased lines at the typical rate of .015 cent/day/-

mile.

Communications controller/processors run from \$50 to \$30,000/mo or from \$2,000 to over \$1 million to purchase. Mainframe computers systems capable of on-line operation can cost \$2,000- to \$50,000/mo to rent or \$50,000 to over \$30 million to purchase.

Modems, on the other hand,

are relatively inexpensive, renting from \$8 to \$105/mo and costing \$135 to \$9,000. Operating system and data base management software is supplied free by "unbundled" vendors but others — including independent software houses — charge up to \$1,000/mo or up to \$69,000 purchase.

Obviously, the cost of ser-

ving even one terminal cannot be derived from figures like these because most components are used to perform a multitude of tasks and because the amount of time they are shared would require microsecond time accounting in order to allocate costs.

Going one step further, the characteristics of the components show there are endless variations in configurations and degrees of sophistication. Most important, however, is

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This is the last article in a three-part series that looks at the integration of on-line and COM systems. The series was coauthored by Frank Malabarba, a computer specialist for the U.S. Navy at Indian Head, Md., and by William McCullough, national sales manager for U.S. Datacorp, a COM service organization.

the fact that each component in a typical system is dependent upon the other.

If the line is "hit" or a processor goes down, the entire system is affected. The backup components can be added, at extra cost, if priorities dictate, but this simply increases cost a little more.

Although on-line systems are expensive, there are many instances when an on-line system is the only way to go, and even others where almost any cost is justified.

If it is determined that computer output microfilm (COM) can meet the requirements of an information system then the costs, when compared with an on-line system, are much smaller.

It is difficult to make an accurate comparison between the two media without specific facts, such as the file size, update frequency, number of terminals, etc. A few comparisons that may be meaningful are as follows:

- A COM viewer can be purchased for less than one month's lease of an IBM 3270 terminal.

- A COM recorder can be leased for about the same cost as one IBM 3330 disk drive.

- A 500,000-page data base could be produced on COM and kept current on a daily basis for less than \$6,000/mo.

The major area to look for possible savings in system planning is to use COM in conjunction with on-line systems as a replacement for mass storage devices.

Before discussing the topic of real-time/current status, it is important to define these terms. "Real time" is the term used to describe the characteristics of a computer system

(Continued on Page 30)

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Free Brochures Available

NEWTON, Mass.— Several firms are offering free brochures and promotional material to *Computerworld* readers.

"A Pocket Guide to Source Data Processing," a 22-page illustrated brochure, is available from Entrex, Inc., 168 Middlesex Tnpk., Burlington, Mass. 01803.

A six-page color brochure on Comtal Corp.'s Vision One image-processing system is available from the firm at 169 No. Halstead St., Pasadena, Calif. 91107.

A 24-page brochure describing electrical connectors and backpanel intraconnection systems is available from Eric Krause at Dynatech Corp.,

1225 E. Wakeham Ave., Santa Ana, Calif. 92702.

A 20-page handbook containing conversion tables and engineering data used in process control is available from the Foxboro Co., Dept 120, Foxboro, Mass. 02035.

Analogic Corp. has a six-page brochure on the firm's line of modular power supplies. Users can obtain that brochure by contacting Ray Schafer at the firm on Audobon Road, Wakefield, Mass. 01880.

A brochure describing Caelus flexible disks is available from Electronic Memories and Magnetics Corp., 1020 Timothy Drive, San Jose, Calif. 95133.

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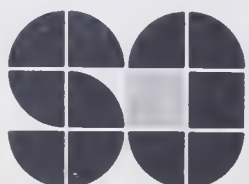
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MDS Adds Drum Printer

PARSIPPANY, N.J. — Mohawk Data Sciences Corp. (MDS) has added a 132-column, 900 line/min drum printer for use with its 1200 and 2400 series of data entry/communications systems.

The Model 2442 has a 64-character set with a 96-character set as an option. It has a slewing speed of 30 in./sec and a 20 msec

line advance speed.

The printer can accommodate forms with up to six parts; the forms can be from 4- to 16.75-in.-wide, a spokesman noted.

The Model 2442 sells for \$30,000 or rents for \$930/mo, including maintenance, on a one-year contract, MDS said from 1599 Littleton Road, Parsippany, N.J. 07054.

COM Cuts On-Line User Costs

(Continued from Page 28)

which not only provides on-line access to information, but also allows immediate update and processing of new information. This latter feature is the key to the uniqueness of real-time systems.

When we talk about real time, I think it is safe to say that there are certain functions of an information-processing system that can only be accomplished on-line to a computer.

Now that we have real time in perspective, let's look at the demand for information as it relates to the allowed time to provide that information.

Reservation, banking and inventory system all fall into the 2- to 5 sec response range, and total transaction time may move them into the 1 min range. Even if we go all the way up to the eight-hour point, it is still difficult to produce and distribute any appreciable volume of information within that time, certainly not on paper and in only certain cases via COM.

But let's look at the 80% of information demands that are not needed within eight hours, those that are given overnight or longer. Now we can open the door to COM-produced information which can satisfy most demands.

If we consider that the greater majority of inquiries into a data base are usually answered using a small portion of the total data available, we can conclude that there is room for improvement in the structure of the on-line data base. Also, considering that some small percentage of inquiries require information from the total data base, what is the best way to improve upon such systems?

If cost is a consideration, then possibly the best way to improve the system would be to purge all data over 24 hours old to a COM file. Using the COM software discussed earlier, the index to the COM file could remain on-line to provide for rapid access to the information in the file. This would not degrade the system in any way.

In addressing the history/audit trail issue with respect to on-line systems, we have to emphasize the accessibility of information as the key feature. Keeping this in mind, what happens to data that has outlived its useful on-line life and must begin a new life off-

line?

In almost every aspect of business today, in one form or another regulations are found that require far more detailed and prolonged recordkeeping than ever before.

When on-line systems design reaches this particular stage, the questions usually faced are: Where do we put this old information and in what format?

The first step is usually to purge the data onto magnetic tape and provide for accessing when the need arises. But let's not forget that "audit trail" is a much more ominous term than "history file." Implicit in the former term is the ability to trace the cumulative results of transactions all the way through a system.

In order to do this on-line, "pointers" are usually provided in the files which send the inquiries either forward or backward through a file to the most current or previous record data. This is necessary because, unlike tape file, disk files are not maintained and updated in the traditional father/son/grandson batch method. So all transactions are usually saved on tape in case files must be reconstructed from some point in time.

Eventually, the string of information which is tied together by pointers grows too

long, becomes outdated and is a burden on the data base system itself. It becomes time to purge.

At this point the data can either remain on magnetic tape, be printed out or somehow preserved on microfilm. It is only lately that this latter format has been recognized as the most cost-effective method.

Joining the two technologies together at this point is another of the more versatile examples of the power of COM/micrographics.

If maintenance of an audit trail is a significant requirement of a particular information system, then COM should receive serious consideration.

The COM software to accept computer data, files changes, create indexes and maintain an audit trail on all file activity is readily available from most major COM companies. It is neither difficult to install nor expensive.

In summary, I do not propose COM as a replacement to on-line systems; This isn't possible in most cases. However, if COM is integrated into the planning of information systems, it could result in overall system improvements and, in most cases, a significant reduction in the cost of the system.

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After Univac Takeover

VDM Users Adopt Wait-and-See Stand

By Esther Surden
CW Staff

What happens when a large computer manufacturer takes over the assets of the vendor with whom you've been dealing?

Varian Data Machines (VDM) users seem to be taking a wait-and-see attitude.

Univac concluded an agreement on June 16 under which it purchased the assets of VDM. It recently sent a letter to Varian users notifying them of the takeover.

According to the letter, Univac has employed approximately "1,000 VDM people involved in the development, manufacturing, marketing and services of VDM products on a worldwide basis," and plans to expand this staff. Through its established sales and service network, the firm pledged to "offer expanded services, systems support, parts and maintenance."

Several users surveyed by CW believe things have to get better with the change in vendors. They noted that Varian had recently experienced great personnel turnover and was never very strong on support.

A university user who has had a Varian 620F-100 for a little over four years and is using the system for data acquisition said "I don't imagine [support] will be any worse under Univac." The system is being used in the chemistry department at Memphis State University.

The department had performed its own maintenance and had had very little contact with the Varian people over the years, according to Dr. J.C. Williams, associate

professor of chemistry. What little contact there was with Varian was marked by a "big personnel turnover," forcing the department to go through a long list of people in order to contact the right person.

Switch 'No Surprise'

Another user, Dr. Charles Klopfenstein, director of laboratories at Oregon University, said he knew for a long time that the switch from Varian to Univac was in the works so "it wasn't a surprise."

"Things can't be any worse than they were," Klopfenstein said. The laboratories have 18 Varian machines of different models and the university has developed its own hardware and software support capability for the system. "The only time we interacted with Varian was when we called up to order a computer," he noted.

With Univac the supplier, "there is a possibility that this could change," he said.

Another educational user of a single Varian V72 system noted that service and support from the

vendor "has got to get better; it can't get any worse. It's been obvious they've been dealing from a situation of crisis for some time."

Because service will be taken care of by the same people who service Univac's systems, responsiveness to complaints and calls for maintenance should improve, according to the user, Dr. Anthony Q. Baxter, assistant professor at the University of Kentucky.

"We have old 620 Ls which are practically obsolete so the switch to Univac has made absolutely no difference to us," according to Robert E. Lee, software specialist for the City of South Bend, Ind.

The city uses the minis as communications front-end interfaces, he noted, and they are "rock solid."

The city has a monthly maintenance contract, Lee said, the system's maintenance is taken care of from the Detroit office. Varian flies in a maintenance engineer and the same person who had been taking care of the minis has continued to do so, he added.

Mini Bits

DEC Drops Prices For Tape Drives

MAYNARD, Mass. — Digital Equipment Corp. reduced prices from 13% to 22% for its TJU45 and TWU45 nine-track magnetic tape subsystems for PDP-11 computers, a spokesman said.

The master tape drive including controller, designated TWU45 for PDP-11/70 computers and TJU45 for other PDP-11s, has been reduced in price from \$26,500 to \$23,000. Additional drives are available for \$14,000.

A two-drive package is also being offered for PDP-11/70 computers, consisting of one TWU45 master drive and one TU45 slave unit. The package is priced at \$31,500, a 22% reduction from the previous figure for the same configuration, DEC noted from Maynard, Mass. 01754.

Ampex Add-In Fits Novas

EL SEGUNDO, Calif. — Ampex Corp.'s ARM-3 is a 32K-byte add-in memory said to be transparent and pin-compatible with Data General Corp. Nova 3 minicomputers.

The unit offers 800-nsec full-cycle operation in 16K-word modules.

The 16K module is said to operate in any address field and no modifications are required to either hardware or software to use the unit with the Nova 3. It costs \$1,725, Ampex said from 200 N. Nash St., El Segundo, Calif. 90245.

Tester Diagnoses Buses

WOODLAND HILLS, Calif. — A test device designed to tell users of Digital Equipment Corp. PDP-11 minicomputers if they have broken wires in the Unibus is available from Datafusion Corp.

Called the OST11 Bustester, the unit is a portable device for "continuity testing of 72-line Unibus cable," a spokesman noted.

An LED display indicates shortened or intermittent wires.

The OST11 Bustester costs \$295 from the company at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

Importer's Mini Tracks Shipments

LOS ANGELES — When one small business system couldn't fill its needs, Laube Corp. turned to another with much success, according to Walter Ising, president of the firm.

The company, a world-wide importer and distributor of steel products and electronic components, used to keep track of shipments throughout the world on an enormous blackboard spanning an entire office wall.

The names of the ships carrying the cargo, identification numbers and logs of merchandise were updated on the board by three employees.

The firm began to computerize with a Singer Business Machines System 10 small business system which, Ising said, "never functioned." When Singer went out of business "we were lucky because we hadn't paid them anything."

The firm then decided to try a different approach. It looked into several systems and decided that one from General Automation was "compact enough and simple enough" to use in its operation.

The firm contracted with California Data Management, Inc. (Cal Data) to design and implement an in-transit inventory tracking, order entry, purchasing and accounting system. Cal Data was chosen because it was located in the same building as Laube and could write a special program designed for the firm's needs. "It was very familiar with our type of business," Ising added.

The General Automation DM 130/2 data management inven-

tory/accounting system used at Laube includes the GA SPC-16 mini with 32K words of memory, 10M bytes of disk, a 165 char./sec printer and two CRT terminals. Although most of the programs are up and running on the system, some still must be modified or corrected.

A minor change is being made in the critical tracking application to allow it to accommodate more than one shipment per order. That application should be running shortly, he noted.

"We used large portions of standard General Automation packaged software and modified

it to fit Laube's application," Cal Data president Malcolm Sherman said.

"The system had to take several variables into consideration. Laube wanted to eliminate manual errors, retrieve inventory information, establish an order tracking system and provide service to customers regarding the status of their orders," Sherman explained.

Because much of Laube's business is conducted with Japan, the system had to handle both dollars and yen and had to deal with English and metric measure-

(Continued on Page 32)

1.8M Bytes of Memory Available on HP 21MX

CUPERTINO, Calif. — Hewlett-Packard has increased the amount of memory that can be used with its 21MX and HP 1000 series systems to 1.8M bytes.

The expansion has been made possible through the introduction of a high-density memory module containing 128K bytes of semiconductor fault-control memory and the addition of an optional memory extender.

The memory module uses 16K-bit n-channel random-access memory chips, HP said.

The increased memory allows the system to be used in applications in which high speed and maximum throughput are important and a disk memory is not suitable, the firm explained.

The memory module with fault

control can be used by any HP 21MX system in the K, M or E series and any 21MX with a dynamic mapping system can be filed-upgraded without changes to existing software, HP noted.

The 128K-byte memory costs \$6,400; the fault-control memory controller costs \$600 and associated check bit boards cost \$2,750 for blocks of memory up to 256K bytes or \$5,000 for blocks of memory up to 512K bytes.

A 12-1/4-in. high E-series with 1M bytes of the high-density fault-control memory costs \$59,800; with an extender including 768K bytes the system has a total of 1.8M bytes of memory and costs \$109,450. HP is at 1501 Page Mill Road, Palo Alto, Calif. 94304.

INTERNETWORKING

Small Businesses Advised to Use DP Resources

FORT LAUDERDALE, Fla. — Small businessmen who avoid using modern technology may face rough roads ahead, B. Joseph Vincent, managing director of Oz International, said here recently.

Sharper competition coupled with increased operating expenses and tighter profit margins are having a stronger effect on the profitability of small businesses today, Vincent said.

Believing small businessmen should begin to take advantage of the benefits modern technology can provide to improve operation, Vincent acknowledged that in the past many small businesses did not take advantage of those benefits for a very important

reason — cost.

However, the increased importance of opportunity costs, cash flow and inventory control on the overall profitability of small businesses have served to reduce the costs of computer-type technology.

"Properly utilized, this technology can help reduce overall operating costs and increase profit margins," Vincent said, "by allowing the entrepreneur to make decisions

based on more reliable information.

"A prime example of the need for more accurate inventory control is the restaurant business.

"For example, if a restaurant orders 10 cases of lettuce on Monday for a featured salad bar week and the customers choose different menu selections during the first part of the week, the lettuce goes bad, money is lost and profit

margins get slimmer.

"If the manager had an up-to-date information system to use in deciding his ordering schedule, rather than seat-of-the-pants reckoning, much of the waste could have been avoided."

If a businessman can't afford his own computer, he may be able to share a computer someone else is using already. There are companies that specialize in selling and main-

taining time-sharing programs.

"Another possibility is the commercial banks that handle their daily banking business.

"If this isn't possible, businessmen could try schools that offer computer courses like universities and technical facilities. Often, they will let you rent time from them and provide expert help in designing programs and solving problems," he noted.

Mini Tracks Shipments

(Continued from Page 31)

ments. Also, the system had a number of logical devices installed to check errors.

"Basically, the most important function of the computer is to provide all order information at the tip of our fingers and give us the status of orders we have placed for our customers at any time," Ising said.

There is usually a long lead time, sometimes five months or longer, from the time of purchase to the time the merchandise is received. The system keeps track of the cargo as it progresses on its journey to the buyer in terms of the buyer's order to Laube and Laube's order to its suppliers.

Supervisory Computer

The majority of activity at Laube is generated from its Los Angeles office. From this location, manufacturing representative needs, ordering, distribution and inventory control are controlled by a mainframe supervisory computer.

In addition, the system here handles accounts payable, general ledger and accounts receivable. The sales department accesses the computer daily to retrieve any sales information.

One operator and two trained backup operators work on the system, Ising noted. Maintenance is handled through a General Automation service contract and has been very good, he added, with the firm never having to wait more than two hours for service.

"I would like to see more business from the system," Ising said. "It has the potential of producing more business by reducing possible cancellations and keeping better track of orders," he explained.



Manual Invoicing 'Too Error-Prone'

Mini Helps Firm Tackle Growing Client Base

MEMPHIS, Tenn. — The installation of a small business system has helped Steelcraft Corp. here cope with a swelling customer base and the resulting paperwork blizzard, according to assistant treasurer D.A. Drewes.

The company manufactures pneumatic dust-handling systems for the woodworking, grain and paper industries and

also produces motor bases and angle rings.

"As the customer base grew to well over 1,000, paperwork also grew. With assorted price lists, the hand invoicing became too error-prone and the hand posting too laborious to tolerate," he explained.

To remedy the situation, the Wang Laboratories, Inc. 2200 minicomputer was selected in

May of 1974 and program installation began that August.

Since acquisition of the minicomputer, the firm has installed a receivable, payable and payroll system, which includes product line and salesmen's sales analyses as side benefits of the invoicing programs.

In addition, the invoice files are scanned for specific prod-

uct sales to provide production control and, together with the necessary sales data, reports are produced that forecast future needs. From the master customer files also come monthly statements and collection letters.

After the basic systems were operational, the company added several applications. Initial applications were program-

med by the software dealer, but Drewes did the rest himself.

Asset and depreciation listings were computerized and annual depreciation charges were calculated. This eliminated burdensome lap schedules. In addition, shop equipment maintenance records were stored on disk and maintenance requests were automatically generated at the proper intervals.

Mailing list programs were also written which could access either the customer master file or purchased lists and then output the proper letter. Price and weight sheets of various standard manufactured items were kept up-to-date and provided to sales personnel as required. Time cards were printed from payroll records, along with lists by seniority and birthdate as well as lists required for various pension and profit-sharing plans. The firm also designed programs which provide sales and sales tax by state for required government tax reports.

Currently two systems to aid the manufacturing division are under development. The first is for use with recently purchased numerically controlled punch and cutting equipment. The program generates the necessary coordinates to cut flat patterns for elbow gores.

This is a mathematical program utilizing trigonometric functions and layout procedures developed over the years for sheet metal products.

Order Control Program

The other system under way will aid in order control, production and erection scheduling. The first portion consists of a field erection schedule, which divides the job into various systems required and traces the progress from original scheduled performance through actual costs of erection. It also tracks the ahead or behind condition through field analyses of percentages of completion.

If more than one system is tied together for erection purposes, the schedule will adjust to this situation as progress is charted. The total schedule will provide quick data on whether the target completion will be met or will indicate that steps must be taken to correct the situation.

The program involved will handle any job with 40 or fewer divisions. Actually, the number 40 is controlled by the 132-column print capability of the high-speed printer, since each division requires three columns plus room on the left of the form for date information.

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*(Published quote of an independent computer expert. Name on request.)

THE DATAPOINT 6600--



*Datapoint 6600 Computer
with 20-megabyte disk drive*

For Network Planners It's a Disturbing System



think about "small" computer systems.

True, the 6600 is small physically, like the Datapoint computers that have come before it. But it is equipped with the latest technology, including features like 120K user memory, and can support up to 24 independently-functioning video display terminals in a true timesharing mode. In fact, the Datapoint 6600 packs the processing wallop of many of today's large-scale computers, at a fraction of their cost.

When combined with Datapoint's wide range of peripheral equipment, such as the new 20-megabyte disk drive, the 6600 can be used to produce a variety of disturbingly capable

systems. It will free network designers from many of the constraints that previously bound them. With the 6600, regional centers can remove a major processing burden from the central mainframe computer while boosting the efficiency of local operations. In fact, a well-planned dispersed processing network can in many cases eliminate "mainframe inflation" altogether.

Like other Datapoint dispersed processors, the 6600 functions well in a stand-alone mode. It has the speed and power to handle 24 different user programs simultaneously, or to run batch jobs in COBOL, BASIC and RPG II. And with communications capabilities always available, a stand-alone 6600 can be converted almost instantly into a functioning node in a dispersed processing network.

In truth, the 6600 is a disturbing system because it will challenge your present assumptions about what a

small computer can do for your operation.

Accept the challenge. Study the Datapoint 6600 in detail. Compare it with the competition. Look at the carefully planned sequence of compatible Datapoint hardware and software products which have preceded it. We think you'll come to the conclusion that the 6600 has more to offer than any comparable system now on the market.

For more information on the 6600, contact the Datapoint sales office nearest you, or write Datapoint Corporation, attention: Product Marketing, 9725 Datapoint Drive, San Antonio, Texas 78284 (512)699-7151

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The leader in dispersed data processing[™]
Sales and service offices in principal cities

Micro Bytes

Real-Time Warfare Game In 8080 Assembly Code

TALLAHASSEE, Fla. — Objective Design, Inc. has a real-time warfare game written in 8080 Assembly language.

"Encounter" allows each player to attack and defend as many places on the field as the player is able to mentally maintain. The play is continuous, according to a spokesman.

Hardware requirements include an 8080 or Z80 processor, 4K bytes of random-access memory, two interfaced Ascii keyboards and a CRT terminal.

With complete rules and source code, the game costs \$16.95 on paper tape and \$19.95 on tarbell tape from the firm at P.O. Box 20315, Tallahassee, Fla. 32304.

Mikados Gets Disassembler

VAN NUYS, Calif. — Inpro Micro Systems has enhanced its Mini Instant Keyboard Assembler, Debug and Operating System (Mikados) to include a complete disassembler.

With the enhancement, Mikados occupies 3K bytes of memory. The \$17.95 price includes a 28-page user's manual and hex object code listings plus a limited 90-day warranty.

California residents must add 6% sales tax, the firm noted. It can be reached through P.O. Box 7776, Van Nuys, Calif. 91409.

Booklet Explains Buzzwords

TEMPE, Ariz. — Byte Shops of Arizona has a catalog of microcomputer systems, peripherals and lexicon.

The "Byte Shopper" serves as an introductory text to personal computing, providing explanations of buzzwords and descriptions of how microcomputers work and where they can be useful.

The guide integrates manufacturer's specifications with a discussion of how each product can be used and how it relates to an overall computing system. Typical systems are pictured and discussed in detail.

"Byte Shopper" is available for \$2 from P.O. Box 28106, Tempe, Ariz. 85282.

German Hobbyists Share Notes

KELKHEIM/TAUNUS, W. Germany — A German computer hobby club has been started under the auspices of CMIX GmbH, which is making available components for assembly of a CMIX 8080 minicomputer.

The club is willing to give others advice on how to start a similar venture.

Further information is available from Martin Jetter, Mozartstrasse 13, D6233 Kelkheim/Taunus, W. Germany.

Kim-1 Housing Offered

SAN FRANCISCO — The Enclosures Group here has developed a housing for the Kim-1 microcomputer.

The housing is manufactured from high-impact thermoformed plastic and is available in a variety of colors.

It costs \$23.50 from the firm at 55 Stevenson St., San Francisco, Calif. 94105.

Altair 8800 Gets Power

ALBANY, Calif. — Parasitic Engineering has a constant voltage power supply designed for Altair 8800 microcomputers.

The unit can replace the three standard 8800 transformers, according to a spokesman.

The power supply kit costs \$90 postpaid from Parasitic at P.O. Box 6314, Albany, Calif. 94706.

Micros Can Be Defined By Genesis, Orientation

By Dr. Adam Osborne
Special to CW

Microprocessors are likely to have a larger impact on DP than many people realize. Today's popular microprocessors all have DP origins.

It is not well-known, but the Datapoint 2200 CPU is the grandfather of today's microprocessors. The 2200's instruction set is equivalent to a very primitive microprocessor, the Intel 8008; however, the 2200 executes instructions 10 times faster than the 8008.

Since Datapoint CPUs have made great inroads into DP applications, this should be enough of an indicator for future microcomputer possibilities.

Fit Two Categories

We can divide microprocessors broadly into those which are ancestors of the Datapoint 2200 — and are well-suited to DP applications — and those which have been designed specifically for digital logic applications. The principal differences between these two sets of microprocessors may be summarized as follows:

- Instruction sets of the DP-oriented microcomputers are adequate for DP applications. Digital logic-oriented microprocessors, on the other hand, tend to have very primitive instruction sets with many key capabilities absent.

- DP-oriented micro can easily be expanded with various support devices to handle peripheral devices such as CRTs, disk units and printers. Digital logic-oriented micros have I/O capabilities that are better suited to creating and processing logic signals.

Microcomputers that can be classified as DP-oriented include the Intel 8080A, the

Zilog Z80, the Motorola MC6800, the MOS Technology MCS6500, the Signetics 2650, the Texas Instruments TMS9900 and the Fairchild 9440. These are all 8-bit microprocessors with the exception of the TMS9900 and the Fairchild 9440, which are 16-bit microprocessors.

The Fairchild 9440 has an instruction set which is identical to the Data General Nova 1200 minicomputer. The Intel 8080A, the Zilog Z80, the Motorola MC6800 and the MOS Technology MCS6500 are all descendants of the Datapoint 2200.

The Digital Equipment Corp. PDP-8/E minicomputer is also available as a single chip microprocessor — the Intersil IM6100.

Digital logic-oriented microprocessors include the Fairchild F8, the RCA Cosmac, the Intel 8048, the National Semiconductor SC/MP, the Scientific Microsystems SMS300 and the Texas Instruments TMS1000.

The Intel 8085 is an enhancement of the 8080A, aimed at making the microprocessor suitable for digital logic applications as well as DP applications. The Zilog Z80 is also an enhancement of the 8080A, but the enhancements were aimed almost exclusively at making the microprocessor more attractive in DP applications.

The principal difference between DP-oriented microprocessors and digital logic-oriented microprocessors lies in the design of the large-scale integration (LSI) devices that constitute the microprocessors. DP-oriented units use a considerable amount of logic to implement a realistic instruction set; they pay the price of requiring many additional support devices before a usable microcomputer is obtained.

Digital logic-oriented devices, on the other
(Continued on Page 38)

Set for Aug. 27-28

Atlantic City to Be Scene of Fair

By Frank Vaughan
CW Staff

ATLANTIC CITY — The Personal Computing '77 (PC '77) Consumer Trade will kick off here Aug. 27 following a week of preconvention activities.

Dr. and Mrs. John Mauchley, both of whom worked on Eniac, the first electronic digital computer, will be featured guests and speakers at the two-day fair.

Over 100 exhibitors are expected to attend the show, according to John H. Dilks, PC '77 director. Heath Co. has chosen the trade fair to make the first public exhibition of its line of computer kits, he noted.

In addition, Cromemco will announce its floppy disk system and RCA will introduce a programmable video graphics machine and its own interpretive language geared toward graphic displays, he said.

Part of this year's PC '77 will include free seminars, forums and technical talks. Subjects will include Eniac, telecommunications, microprocessor design, robots, interfacing, the human factor, music, the handicapped, applications and debugging, Dilks said.

A Personal Computing College consisting of four groupings will be held during the week preceding PC '77.

Dr. Adam Osborne of Osborne and Associates, Inc. will present "Microprocessors — Where They Came From and Where They Are Going," an analysis of products on the market today.

The Aug. 26 and 27 seminar will last six hours and cover a variety of subjects. Infor-

mation and reservations are available through Osborne and Associates, Dept. PC '77, P.O. Box 2036, Berkeley, Calif. 94702. The telephone number is (415) 548-2805.

Tychon, Inc. will present a three-day "Microcomputer Interfacing Workshop" to provide hands-on interface experience for participants. Reservations can be made with the firm at Dept. PC '77, P.O. Box 2203, S. Hackensack, N.J. 07606.

Sybex, Inc. will present "An Introduction to Microprocessors" on Aug. 25 and 28. It will include information on basic definitions, system components, what to look for, impact and evaluation.

On Aug. 26, the firm will present "Microprocessor Applications," which will detail the main application techniques of microprocessors. Information and reservations can be obtained from the firm at 2161 Shattuck Ave., Berkeley, Calif. 94704. The telephone number is (415) 848-8233.

Technical Design Labs and Trenton State College will combine forces to produce a series of Z80 seminars. The Aug. 22-26 seminars will cover programming in Basic, Assembly language programming, Fortran IV, word processing, introduction to hobby computing, digital logic circuits, how to set up a computer store and a kit building lab. Information and reservations are available from Z-80 Seminars, Trenton State College, Trenton, N.J.

Additional PC '77 information is available by contacting the show at Rt. 1, Box 242, Mays Landing, N.J. 08330.

MICROCOMPUTING

To the VP of manufacturing who'd rather be on-line instead of on-the-carpet:





An on-line inventory management system is a nice thing to have when you need answers in a hurry. Especially if the system gives you the controls you need to make sure the answers are not full of surprises.

To our V.P. of manufacturing, such a system is more than a nice idea; it's absolutely essential. By being on-line to an interactive, multiuser Prime computer programmed to handle Prime's specific needs, he has everything under control. Last year, for example, the system helped his organization control the variance between physical and book-value inventory to less than 0.1%!

So if you've been spending too much time on the carpet explaining variances more like 5%, a Prime computer can help you control your inventory as tightly as our V.P. controls ours. In fact, the money you'll save by reducing your variance will no doubt pay for the complete system.

Depending on how many people in your organization need answers in a hurry, you can get a Prime computer that handles up to 63 terminals simultaneously. You can develop the inventory management system that fits your needs perfectly, using the software tools available with PRIMOS, Prime's virtual memory management operating system. PRIMOS gives you access to powerful file processing and CODASYL-compliant database management systems; a forms management system; and a choice of languages including ANSI '74 COBOL, FORTRAN IV, RPG II and BASIC.

Large databases can be managed with ease since on-line disk capacity can be as large as 2.4 billion bytes; main memory as large as 8 million bytes.

Typical systems for database management applications range from \$100,000 to \$350,000, or about \$2,170 to \$7,600 per month if leased directly from Prime.

To find out how being on-line to a Prime computer can keep you off the carpet, talk to Robert P. Berkowitz, vice president of manufacturing, Prime Computer, Inc., 145 Pennsylvania Avenue, Framingham, MA 01701, (617) 879-2960.

PRIME

Prime can help

Datapoint 2200 'Grandfather' of Microcomputers

(Continued from Page 35)

hand, generate whatever instruction set they can from a very limited amount of logic; if they want to keep down part counts to satisfy the economics of very high volume consumers (such as television manufacturers).

Obvious Differences

An Assembly language programmer with minicomputer experience, when encountering a DP-oriented microcomputer, will find surprisingly few differences between the products as far as instruction sets are concerned. The most noticeable difference will be word length — commonly 8 bits for microprocessors and 16 bits for minicomputers.

Other noticeable differences are:

- Microprocessor instruction sets are almost uniformly well-suited to pure procedure programming; that is to say, these instruction sets naturally lend themselves to separate program and data memory areas, where the program memory will never be changed during the course of a program's execution and can therefore be defined permanently in read-only memory.

- Microprocessor instruction sets have relatively limited memory reference capabilities. Indirect and indexed addressing is rare, while even direct memory addressing is not always available.

Implied memory addressing is the principal method used by microprocessors; this involves main-

taining memory addresses in memory address registers, then having memory reference instructions simply identify the memory address register where the memory address is to be found.

Surprisingly, DP-oriented microprocessors make very effective use of memory. For example, the Intel 8080A and the DEC LSI-11 will usually generate object programs requiring approximately the same total number of program bytes. The 8080A source program, however, will have two to three times as many Assembly language instructions create 1 byte of object code, while none create more than 3 bytes of object code.

This makes Assembly language programming far more tedious, and therefore expensive, when using a microprocessor; however, higher level languages are rapidly becoming available on the more popular microprocessors.

Today Basic is the most commonly used higher level language while PLM (a subset of PL/I) is in relatively common use. Fortran is just beginning to appear.

Microcomputer systems based upon DP-oriented microprocessors typically offer CRTs and keyboards, floppy disk units, cassette units and matrix or daisy wheel types of printers.

Fixed-disk units are not generally used since their data storage capacity and data transfer rates simply overwhelm the average microprocessor.

Similarly, very high-speed printers offer more capacity than a floppy disk-

based system can utilize. Thus a typical microcomputer system will have these components:

- A microprocessor unit (MPU).
- Between 8K and 32K bytes of memory (64K bytes is the usual maximum).
- One CRT terminal.
- Floppy disks with a data storage capacity ranging between 250,000 bytes and 1 million bytes.
- A matrix or serial printer with print speeds ranging between 40 char./sec and 300 line/min.

This is a respectable computer system which a small company can use for its data processing. Such a system will cost approximately \$10,000.

Speculating Ahead

It is interesting to speculate on the future.

Already it is possible to buy the Nova CPU or the PDP-8 CPU on a single chip. The PDP-8, by today's standard, is a relatively inefficient microprocessor.

The advances we are seeing in LSI technology make it probable that by 1985 single-chip CPUs selling for less than \$100 will offer capabilities that rival mainframe computers available today. It is not unrealistic to expect CPUs with the performance of an IBM 360/40 to be available by 1985 and selling for less than \$100.

It is already possible to buy 16K of read/write memory for less than \$500. By 1985 it should be possible to buy 64K bytes of read/write memory for

less than \$200.

Thus hardware costs will continue their incredible downward spiral while performance will penetrate well into the area of 1977 mainframe computers.

It is hard to visualize what the impact of this technology will be on the DP industry in general. Certainly companies with a massive investment in application software are not interested in minor hardware savings that may accrue from inexpensive microcomputer-based systems. Also, until massive breakthroughs are made in reducing programming costs, reductions in computer hardware costs may represent too small a portion of the total installation expense to be significant.

Breakthroughs in programming costs are being made. Logical Machine Corp. has the Adam computer, which may make this breakthrough. This is a computer that can be programmed in English, with a user-created vocabulary. While Adam has not eliminated programming languages, it has gone a long way in this direction.

Logical Machine will probably be one of the principal beneficiaries of new, more powerful and less expensive microelectronics, since this will allow the "programless computer" concept to be taken from its present relatively primitive dimensions to computer systems that are really programmable by accounting professionals and nonprogramming personnel.

Osborne is president of Osborne and Associates, Inc. of California.

MICROCOMPUTING CLASSIFIED EXCHANGE

This special classified section in solid (non-display) format is designed for people who are working with or interested in microcomputing. Through it, you can buy, sell or swap equipment software or services; contact people with similar interests; start clubs; disseminate information; look for game partners; or send messages to other individuals. As the number of ads increases, this section becomes more useful; so we've tried to make ad placement as simple and inexpensive as possible. Details are as follows:

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CI Notes

The New PCMs — Part 1

IBM-Type CPUs Increasing

By Toni Wiseman
CW Staff

The ranks of plug-compatible mainframe manufacturers are steadily swelling as more and more vendors enter what some have called "anyone's horse race."

Is this the way of the future? How far will IBM allow these plug-compatible manufacturers (PCM) to go?

Will Brand X machines appear? How will new technology affect PCMs?

These are all questions being whispered in DP shops, but industry observers don't agree on all the answers.

IBM-compatible mainframes certainly form an attractive and viable marketplace, and most agree the industry can expect to see more firms joining the ranks of Amdahl Corp., Control Data Corp. and Intel Corp. The most likely candidates are the Japanese, some feel, but another U.S. competitor may still register his colors.

"I don't think the companies are looking at the giant with the idea to stab IBM. They're simply accepting it as a market force, as a mountain sitting there and so — mine the mountain," Art Yerkes, Datapro Research Corp.'s mainframe editor, said.

"IBM is so big and its installed base is so big that there's enough throw-off on this thing that it creates a new type of product — the plug compatible," Yerkes believes.

"It wouldn't be reasonable at this point for anyone to make a Honeywell- or Burroughs-compatible machine because they're not as big as IBM, which probably has about 80% of the market. But if, hypothetically, someone got lucky and came up with a system that erodes half of IBM's market so each has 40%, the remaining six dwarves et al still have only 20% divided among them.

"But now there would be two huge markets to attack with plug-compatible machines," he said.

It's clear that PCMs are having a very powerful effect on IBM

This is the first article in a three-part series that looks at the fast-developing plug-compatible mainframe scene and its various players, including IBM.

Part 2 will examine marketing strategies, counterstrategies and new technologies from the viewpoint of industry observers; Part 3 will consider the phenomenon from the viewpoint of the investment community.

because the corporation is obviously doing a variety of things to react — the 3033 for instance, Elinor Gebremedhin, project editor at Auerbach Publications, noted.

"All you have to do is look at Amdahl deliveries and the fact that it got profitable so quickly" to realize the attraction of the market, she said.

A host of plug-compatible machines on the market will not take competition away, however, Gebremedhin suggested, since the machine is only a very small part of the situation. "It's the

software background, the expertise of the manufacturer and the services it can deliver that are the more important part. The biggies are the system manufacturers, not the machine manufacturers," she said.

Important Edges

Nevertheless, PCMs do have some important advantages at the moment, according to Frederic G. Withington, senior staff member at Arthur D. Little, Inc.

"Without having specific delivery dates, people know the 3033 is a long way off and some of them are interested in a shorter term-delivery. Also, Amdahl offers the 470V/5, which is under the 3033, and IBM hasn't announced a comparable product," Withington said.

"This all means that Amdahl and the others are in pretty good shape now, but of course this is a temporary condition," he warned. "The time will come when the new IBM processors are equally available and then that particular advantage for the PCMs will disappear."

The industry observers all agreed that plug-compatible products are probably not going to be the only form of competition. In fact, plug-compatible main-

(Continued on Page 42)

Calcomp Workers On Shorter Week

ANAHEIM, Calif. — California Computer Products, Inc. has shortened its work week to a four-day, 36-hour week "to increase productivity, raise employee morale and reduce costs."

Under the plan, which became effective Aug. 1, the company switched to a four-day week, and lengthened the former eight-hour day by one hour. The employees' contribution to the plan is a reduction of 5% in their gross income, providing the company with an important cost saving, according to Calcomp.

The plan will also result in savings from reduced expenses for plant security, electrical energy consumption and maintenance.

The "4-36 Plan," as it has been dubbed, affects some 1,700 employees. Field sales and service personnel were not affected.

IEEE Members Form

Good Government Group

NEW YORK — Members of the Institute of Electrical and Electronics Engineers (IEEE) have announced the formation of the IEEE Good Government Group (GGG).

The activities of the IEEE/GGG will be aimed at strengthening the leadership of the IEEE by identifying, endorsing and actively supporting the best available candidates for president, vice-president and directors, according to Dr. F. Karl Willenbrock, secretary of the IEEE/GGG steering committee.

Candidates for IEEE offices who are interested in a possible endorsement by the IEEE/GGG should contact Willenbrock at the School of Engineering and Applied Science, Southern Methodist University, Dallas, Texas 75275.

Nixdorf 8820 Reappears

CHICAGO — If you thought you saw a new intelligent terminal from Nixdorf Computer, Inc. at Interface '77 last March in Atlanta, but wondered what happened to it, you can stop wondering.

The intelligent terminal system called the 8820 was shelved when Nixdorf acquired Entrex Corp. of Burlington, Mass., because its features could be incorporated more appropriately into the Entrex product line, according to a

Nixdorf spokesman.

The 8820 can operate as a stand-alone terminal system or on-line with a host CPU and includes remote and real-time processing features and multiple disk storage. Its features will probably surface in a future Entrex product, the spokesman stated.

Nixdorf expects the acquisition of Entrex to double the size and capabilities of the German-based firm in this country, he said.

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Firms With Plug-Compatible CPUs Increasing

(Continued from Page 39)
frames are probably not even a good idea for some manufacturers.

Withington, for example, said he "feels strongly that the organization providing the operating system and the most complex systems programs in general is the piper which calls the tune to which the others must dance."

This means there are really only four organizations —

IBM, Honeywell, Burroughs and Univac — which are in a position of leading the general systems parade, he said.

"This does not preclude, however, the PCM people from being so quick and capable that they can keep up with anything that's done by the systems programs people and at this point I'd call it a horse race."

Are plug-compatible machines going to be the "in" way

to compete? Auerbach's Gebremedhin believes that while PCM systems are definitely an important market factor, they are not going to wipe out other types of competition.

"IBM has an important part of the market, but other mainframers are certainly going to hang on to what they have and develop their strong points," such as Burroughs' position in the financial and

banking industry, NCR's in the retailing area and CDC's in the scientific arena, she said.

'Big Six' Entry Doubtful

While some of those interviewed said other mainframers could enter the plug-compatible mainframe arena, some doubted whether others of the "Big Six" would enter because to do so would, to a certain extent, undermine

their own offerings.

Gebremedhin suggested that CDC is the only logical contender since it has been in the plug-compatible business for a long time and has been very successful with plug-compatible peripherals where other manufacturers have not.

In addition, CDC is not in the same position as some of the others, she pointed out, since it has largely concentrated on scientific systems in the past. It would therefore seem logical for CDC to enter the business end of the market with a plug-compatible machine.

Not Sensible

But, she added, it would not make sense for Burroughs, for instance, to offer an IBM-compatible machine which would compete with its check-processing systems.

Withington, on the other hand, said he could not see any reason why another mainframer could not build and market an IBM-compatible machine — and why that mainframer's base could not be a target for IBM or others.

He also proposed the possibility of a large mainframe corporation offering two entirely different large processors in the same price range — one with XYZ software and one with IBM software. While these two machines might compete internally in maybe 5% of the cases, it is rare for large users to switch from one operating system to another.

Japanese Expected

James Peacock, vice-president of International Data Corp., agreed it is reasonable to expect some new competition in the PCM market, but he expects the newcomers to be Japanese.

He pointed to the fact that Amdahl is working with Fujitsu and Intel has recently joined with Hitachi. Both Japanese firms already produce systems which are nearly IBM plug-compatible.

Gebremedhin observed that the Japanese have a problem in that they don't have either a software build-up or a marketing organization in this country. Therefore, it's entirely logical for them to team up with an American manufacturer that lacks the mainframe capability but has a large sales and marketing organization.

be the next firm to enter the market. "However, its expertise is more with a Honeywell-type system, so it may not go forward into the IBM market."

Counterstrategies are expected from all sides. Next week: What will these counterstrategies be, and how far will they go?



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Telefile Helping Xerox Systems Users Continue

By Toni Wiseman
CW Staff

IRVINE, Calif.— In the past year and a half since Xerox Data Systems (XDS) withdrew from the mainframe business, Telefile Computer Products, Inc. has made it its business to supply the needs of XDS systems users.

Not content with simply offering new peripherals, Telefile is developing two new Sigma mainframes for delivery in 1978. These include a microprogrammed Sigma 9 and a Sigma 11, designed to be four times faster than the present Sigma 9 at about half the price.

Telefile's strategy is to replace only the computing engine at first, and then gradually update the I/O and memory, to avoid a total replacement at once, according to president Sam V. Edens.

In addition to the CPUs, Telefile offers a wide range of hardware-compatible, software-transparent products including dual-density disk systems, printers, card readers, concentrators, main memory and mass storage facilities with up to 2.3 billion bytes per system.

A 317M-byte Winchester-type system with fixed-head option will also be available by the end of this year, Edens said.

Best Operating System

Telefile's whole philosophy is based on the concept that it is easier to take someone else's \$100 million investment in software, such as Xerox's, and put another machine under it, than to develop new software, Edens indicated. And, he said, everyone from the users to Datapro agree that the Xerox operating system is the best available.

Amdahl has built a machine to run IBM software, so in some aspects Telefile and Amdahl are in the same business, Edens said. "But in our case, we have a lot more going for us because IBM's software is constantly changing, whereas there is no one left at Xerox's helm to make changes, so we are dealing with a known quantity. We don't need a crystal ball," he noted.

IBM Appoints Three Fellows

ARMONK, N.Y. — IBM has named three new IBM Fellows, an award which provides the three with the opportunity to pursue technical projects of their own choice for the next five years.

The new Fellows are:

- Dr. Alec Broers, a pioneer in the development of high-resolution scanning electron microscopes and in the application of electron beam technology to the fabrication of ultraminiature computer devices.

- Donald K. Rex, for significant contributions to the development of multifunction card-handling equipment. Rex was recently a key figure in the development of a small terminal matrix printer.

- Thomas H. Simpson, the designer of a multitask operating system for the National Aeronautics and Space Administration's Saturn-Apollo program. Simpson's revised version of the system is IBM's Hesp.

Honeywell's goal is to convert Xerox users to their Level 66, but that is a fairly large machine. Sigma 9 users are prime candidates for conversion but those with an 8, 7, 6 or dual 5s are not ready to make the move, Edens stated. "Those users have to at least be upgraded to a 9 before they can think of converting to a Level 66. That means there's a tremendous market out there for us."

Edens said he feels Honeywell's recent product announcements, such as retrofitting disks to older iron, are the result of the market of Sigma 5, 6, 7 and 8 users. "They are going to have to keep the user base intact for longer than they thought," he said. "I don't see people with Sigma 6s going to a Level 66 before 1985."

Telefile's relationship with Honeywell, which took over maintenance of the Xerox user base, has been an amiable one so far. Their goals are essentially the same: to keep the Xerox user base alive and up to the state of the art. Telefile, however, doesn't care if the users ever convert to a Level 66 machine, Edens noted.

Edens' firm wants to enhance the Xerox systems not only through core and new peripherals but also by going beyond the specified core limits. That is why Telefile put Memory Map on the Sigma 5. The T8215 Memory Map allows Sigma 5 users to take advantage of the CP-V and CP-R software originally designed for Sigma 6-9 systems and permits multiprocessing.

The entire Xerox user base amounts

to only about 1,400 sites, so there isn't much impact on Honeywell's financial picture. But for Telefile, that represents a substantial market, Edens said, noting there is very little defection among Xerox users.

This means Telefile is not interested in buying Sigmas from users unless there is no way to prevent users from switching vendors. When there is no other way, however, Edens will buy a Sigma 9, for instance, to keep the business intact until Telefile's Sigma 9 emulator is available.

"The Sigma 9 and 11 in development are set up to solve the problem we will face in time when we can't keep the base intact through enhancements and upgrades anymore," he said.

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PDP-11 Leading Choice for Military Standard

By Edith Holmes
CW Staff

DALLAS — Digital Equipment Corp.'s PDP-11 architecture is "the leading candidate for the standard" computer that will be used in all U.S. military operations, a conference speaker said here recently.

Spearheading the Military Computer Family Program that eventually could serve all branches of the Department of Defense (DOD), the Army would like to stop inventing computer architectures and look to the commercial world to meet its computer needs, Lt. Col. Alan B. Salisbury of the U.S. Army Electronics Command said.

The DOD spends \$3 million a year on software development, according to figures from the Office of the

Secretary of Defense. A common architecture base for a family of computers used by the military would give DOD "true transportability of programs between these battlefield systems," Salisbury stated.

By architecture, the Army officer indicated he meant "what the computer programmer sees as he looks at the mainframe from the machine level." In other words, his concern — and DOD's — is with "instruction set architecture."

The Army's attempt to develop a family of architecturally identical machines is not new, Salisbury noted. Between 1969 and 1974, a program called Family of Compatible Computer Elements (Facce) had similar goals.

What the Army learned about com-

puter family interfaces and configurations with Facce will be very helpful in the current Military Computer Family Program, he added.

The PDP-11, will provide the Army with the "form fit in function for computer modules for the military computing" it needs, he said.

No Closed Doors

At the same time, the DEC machines won't mean the Army has closed its mind and doors to research in computer architecture.

In addition, in order to maintain its deployed computer resources, the Army doesn't want to have to have 35 different kinds of spare parts on hand, Salisbury commented.

In terms of continued computer

architecture research, the Army will remain interested in system-level modifications — new ways of interconnecting, interfacing and configuring its family of mainframes. "We are particularly looking for ideas in distributed system architecture," Salisbury said.

If military computers are to be able to survive attack, they must be distributed, he contended.

Research in micro-level architectures, the hardware point at which standard instruction sets might be implemented, is also in demand by the Army. Microprogrammable modifications that would permit the system to run new programs and still emulate the old architecture for old software need to be developed as well, Salisbury indicated.

The Army plans to stay with whatever commercial architecture it settles on for the near future. However, the DOD branch expects to be open to expansions of that architecture.

Industry Hit For Lack of Ideas On Architecture

DALLAS — The U.S. government has received very few good private industry research proposals for work to be done in computer architecture, according to panelists at a recent conference here.

The industry has created microprocessors by increasing the density of logic placed on a chip, Dr. John Lehmann of the National Science Foundation (NSF) noted. Now fundamental research is needed that will permit the successful combination of these chips in numbers like 10,000 and up, he said.

These new microprocessor-based computers are likely to be quite different from what we recognize as mainframes and minicomputers today, Lehmann added.

"We will need to develop the interconnections, communications, reliability and fault-tolerance capability for these machines," he stated. The algorithms needed to solve standard computational problems may also require change.

Funds Available

NSF has approximately \$1 million available to support basic work in computer architecture, Lehman said. With the lower cost of electronics associated with micro-based processors, he hopes some of this money will flow back to the universities that deferred to industry in the research area during the late 1960s and early 1970s when costs soared.

The Air Force, too, has money to burn in the area of computer architecture if only it could find people with sound proposals to fund, Lt. Col. George W. McKemie of the Air Force Office of Scientific Research at Bolling Air Force Base said.

Among the research thrusts the Air Force believes are needed to accompany the potential that micros have are work in design methodology, performance and complexity and operating system and applications software, McKemie stated.



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At Competitive Disadvantage

U.S. Firms Unsupported Abroad: ADL Head

WASHINGTON, D.C. — Although the U.S. leads the world in telecommunications technology, American suppliers labor under extreme competitive disadvantages in marketing their products and services abroad, according to John F. Magee.

Magee, president and chief executive officer of Arthur D. Little, Inc. (ADL), testified here recently before the International Operations Subcommittee of the Senate Foreign Relations Committee during hearings on the role and control of international information and communications.

"Low interest rates and extended terms are part of the export packages German, Swedish, Japanese and even South Korean equipment manufacturers can offer, but which American suppliers cannot," Magee said. "Those nations look to the longer term, when the very system and products they sell today under such favorable conditions help generate the future cash flow to pay for themselves."

These aggressively supportive foreign trade programs contrast with policies and attitudes in the U.S. that are passive and even antagonistic, the ADL president continued.

Tax Act of 1976

He cited the Tax Reform Act of 1976 as another factor that has further undermined America's competitive position in the international marketplace. Overseas cost reimbursements to companies and deductions for their employees, formerly allowed to offset the business and personal expense of operating and living abroad, have been eliminated or reduced.

As a result, the American managerial and technical presence in foreign countries is already beginning to diminish. The U.S. is losing one of its strongest selling points — the export of technological talent together with its industrial systems, Magee said.

"In our information-oriented world, telecommunications is a key building block in creating a sound infrastructure for economic growth... Telecommunications investments provide more reach per dollar than other investments in bringing people up to the last quarter of the 20th century," he said.

Used Unit Sales Up 62% in '76

CHICAGO — Members of the Computer Dealers Association (CDA) sell 39% of the volume of the largest used capital asset business in the world, according to a recent survey taken by the association.

Of the \$1.2 billion worth of used computers purchased in 1976, the 64 CDA members sold \$463.9 million, an increase of 62% from fiscal 1975.

The report also revealed 96% of these sales were in IBM equipment because IBM's policy allowing maintenance agreements to other than original owners is a tremendous sales advantage. CDA members also spent \$87.4 million on new IBM equipment just to support their trades in used equipment.

Magee expanded on this view by pointing out that a telecommunications system makes it possible for a developing nation to establish connections with the outside world, helping to break its isolation and the log-jam that keeps its industrial and resource potential locked in.

Traditional Symptom

"Low per-capita telephone density traditionally has been regarded as a symptom of low economic development," he continued. "But now, many of us believe the symptom has become ingrained and should be counted as one of the major causes of underdevelopment."

Magee referred to a traditional view of telecommunications which holds it to be an outgrowth of a solidly established industrialized society whose vitality generates an increasing need for business and personal messages.

"This is now an outmoded thesis rejected by the less-developed and developed nations alike. There is a growing recognition today that telecommunications is more of a precondition than a consequence of industrial and social development," he said.

Calling for a review of long-held biases and for measures to bring U.S. telecommunications export policies in line with current world realities, Magee concluded that "every foreign

sale of American high-technology or heavy-industrial systems lays the foundation for add-on business in the same or associated areas.

"Every group of American technicians overseas trains a generation of foreign technicians. This is a kind of technology transfer that creates a continuing demand for more of the same systems, or their successors.

"For every such sale we lose to another country, and for every American technician who does not serve as a technological ambassador, our base of foreign trade is eroded, jobs at home are wiped out and an opportunity to impart understanding and respect for American culture is lost."

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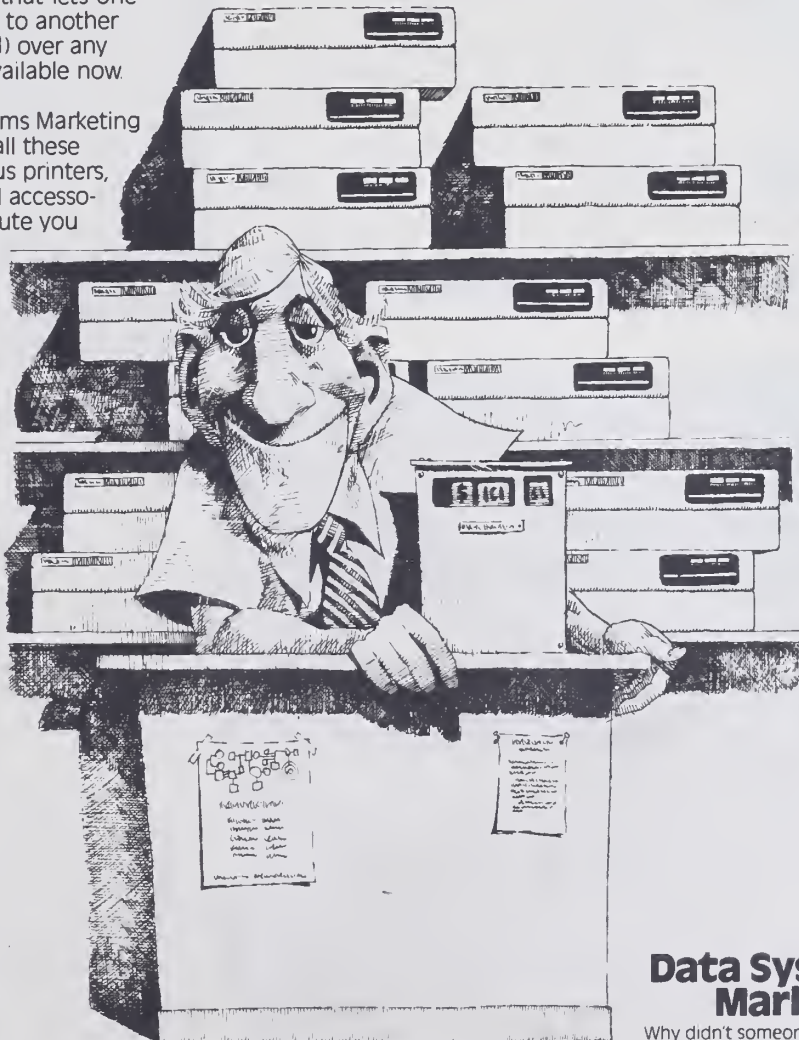
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Orders Up 25% in Quarter

Univac '80 Revenues Seen Topping \$2 Billion

By Molly Upton

CW Staff

NEW YORK — Sperry Rand Corp.'s computer revenues should exceed \$2 billion by 1980, Chairman J. Paul Lyet told stockholders at the firm's annual meeting here recently.

"Computer revenues have grown 15% per year for the past five years and profits have done even better," Lyet observed.

To add credibility to his projection, he pointed out that Sperry was within 2.5% of its recent five-year projection of earnings per share. Sperry's goal this year is a 12% to 15% increase in earnings.

Sperry prefers not to divulge earnings and revenues of its individual divisions, but Lyet said the Univac division did "very well" in the first quarter in terms of both orders and profits compared with other computer companies.

"We have felt it would be disadvantageous to us to set forth separately how we're doing in our competitive segments," he told a stockholder seeking more information.

The corporate backlog rose 22% from \$2.09 billion at the beginning of the fiscal year to \$2.2 billion at the end of the first quarter. Univac orders rose

25% in the quarter.

The Sperry Division's orders jumped 99%, reflecting defense contracts.

Univac President G. Gerald Probst said later the Univac orders were distributed across the product line, adding demand for the 1100/80 exceeded expectations. The 90 series — especially the 90/80 and 90/30 — was also strong, he added.

New Products Coming

Lyet told the press Univac will have some product announcements it thinks are going to be significant in the next 12 months.

The firm is continuing to invest "very substantially" in research and development in the 1100 and 9000 series, as well as the 90/30 family.

"At Sperry Univac in particular, we have spent more on R&D as a percentage of revenue than any of our four largest competitors over the last five years," Lyet told shareholders.

"This means we have products in the oven we can serve up in future years that will provide continued growth.

"R&D spending will be up 13% to 15% this year," he continued. Last year the firm spent \$168 million in R&D, 60% more than five years ago.

The firm is working on LSI circuitry,

fiber optics, electron beam lithography and a nonimpact printer with speeds of 10,000- to 20,000 line/min, he said.

None of the products coming out

products not on the market today. "This is how to keep a company viable, dynamic and alert, even though it impacts your P&L statement," he said.

Sperry Earnings Rise 7.8%

NEW YORK — Earnings increased by a larger percentage than revenues at Sperry Rand Corp. during the first quarter ended June 30, which marked the firm's 21st consecutive quarter in which earnings and revenues showed improvement over the year-ago period.

Earnings hit a record \$37.5 million or \$1.08 a share, up 7.8% over the \$34.8 million or \$1 a share in the same period last year.

Revenues rose 5.1% to \$827.9 million compared with \$788.1 million

in the same 1976 period.

On a 12-month running basis, revenues were up 2.8% to \$3.3 billion while earnings rose 8.7% to \$159.5 million.

By March 1978, Univac will have increased its commercial marketing force, exclusive of the organization set up for the BC/7 and the people gained through the Varian acquisition, by 44% compared with nearly two years ago, Sperry Rand Chairman J. Paul Lyet said.

within the next 12 months will have bubble memories, he told the press.

Sperry has great hopes for its latest acquisition, Varian Data Machines, Lyet indicated to the press.

Noting that Information Storage Systems (ISS) has been one of Sperry's most successful acquisitions, Lyet said he feels this type of benefit will be paralleled by the Varian acquisition. He expects Varian's growth to be as rapid as that of ISS, he added.

Robert E. McDonald, president of Sperry, said the basics are there, but Sperry is adding some management and marketing capabilities. He admitted the Varian software needs some help and the product line should be broadened.

When asked about the impact of the IBM 3033, McDonald said Univac brought out the 1100/80 with the recognition that IBM would have a powerful machine. Univac has not been impacted by the 3033 and has "won some tough competition," he added.

"I suppose if IBM had not brought out the 3033, maybe our profit margin would have been greater, but that's not the real world," he mused.

McDonald indicated he thinks the specter of a price war among IBM plug-compatible CPU makers, including the Japanese, "a significant long-term competitive challenge."

Lyet reiterated, as he does every year, Univac's eagerness to form joint ventures similar to the one it has with Saab Scania. Noting he is very pleased with Saab Univac AB, which has obtained orders from Scandinavian Airlines for an airline reservation system and from the Swedish postal authority, Lyet said such a joint venture ought to work in other parts of the world.

Surmising on why Univac has not had any other takers, Lyet observed firms in other countries have had good support from their governments. He also suspects they don't want to be captive to the Americans in the computer business since it is so integral to business. "They want to be master of their own fate," he added.

"We still stand ready to deal and have got our antennae up," Lyet said.

Extolling the virtues of expenditures, Lyet said that in five years about 80% of Sperry's revenues will come from

Lyet expounded on his theory of why Sperry Rank's stock is as low as it is. When computer stocks were high, Sperry's revenues were more cyclical and although the firm was a conglomerate, it was "metaphorphasizing" into a computer company.

After extensive efforts to educate the investment community that it should be treated as a computer company, the computer stocks started to go down. In the meantime, farm machinery was becoming suspect because of uncertain demands.

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For Investors, Marketers

Bowers Adds Five Services

FAIRFIELD, Conn. — Bowers Engineering Co. has added five fixed-price packaged services to its line of consulting and engineering packages.

The Quick Study was designed for investors, potential acquirers or users planning a major vendor commitment, and in need of a professional overview of a company, its personnel, products, resources, competence, etc. Quick Study is said to offer a one-day on-site analysis, with written report, for \$500 east of the Rockies, \$750 in the West.

Acquisition Analysis was designed for companies seeking to acquire products or other companies in a particular technical area. It identifies potential acquisitions and evaluates the companies, their products, market position and financial strength, the firm said.

The top candidates are selected and evaluated on-site, and recommendations and strategy are presented. The package is priced at \$3,900.

OEM Buyer Analysis identifies attractive markets and potential OEMs for a client product, the firm claimed. The OEMs, their market strengths and their make/buy attitudes are assessed and the top prospects are evaluated on-site for a fee of \$3,900.

Equipment Evaluation is offered to users considering equipment purchases, vendors wanting an independent critique of their equipment, and acquirers needing to understand the quality of a product they are acquiring, Bowers said.

The equipment of interest and its vendor's methods are evaluated as to design, manufacturing processes, testing and quality control in light of the client's needs and applications. Existing installations and customers are investigated for \$2,700.

Competitive Analysis consists of a

survey of equipment or service being marketed, vis-a-vis a client product or a contemplated product, according to Bowers. It includes an analysis of the client's product, a complete survey of all competitive companies and analysis of their products and markets for a fee of \$2,700.

Bowers is located at 1214 Post Road, Fairfield, Conn. 06430.

New Registrations

MEMOREX CORP., San Tomas at Central Expressway, Santa Clara, Calif. 95052, filed to register 200,000 shares of common to be issued in connection with the merger of Lencor International into a wholly owned subsidiary of Memorex. The merger will result in the conversion of the outstanding shares of common of Lencor into the Memorex common and \$2,440,000 in cash (subject to certain adjustments). No underwriter is involved.

MOTOROLA, INC., 1303 E. Algonquin Road, Schaumburg, Ill. 60196, filed to register 2,250,000 shares of common to be issued to the stockholders of Codex Corp. pursuant to a statutory merger of a wholly owned Motorola subsidiary into Codex. Motorola will issue 1.125 shares of Motorola common, subject to certain adjustments, for each share of Codex common outstanding on the effective date of the merger. No underwriter is involved.

AMDAHL CORP., 1250 E. Arques Ave., Sunnyvale, Calif. 94086, filed to register 560,000 shares of common to be offered for selling security holders through underwriters represented by the First Boston Corp., 20 Exchange Place, New York, N.Y. 10005, and E.F. Hutton & Co., Inc., One Battery Park Plaza, New York, N.Y. 10004. Of the 560,000 shares being offered, 460,000 are presently outstanding and 100,000 are to be issued upon exercise of warrants held by two security holders.

ITEL CORP., One Embarcadero Center, San Francisco, Calif. 94111, filed to register 2 million shares of cumulative preferred to be offered for sale through underwriters represented by Blyth Eastman Dillon & Co., Inc., One Chase Manhattan Plaza, New York, N.Y. 10005, and Paine, Webber, Jackson & Curtis Inc., Broadway, New York, N.Y. 10005.



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Expansions

Data Terminal Systems, Inc. will begin construction of a three-story 75,000 sq-ft addition to its existing manufacturing space in Maynard, Mass. and a 40,000 sq-ft renovated facility in Stow, Mass.

Synertek has begun construction on a 61,000 sq-ft facility in Santa Clara (Calif.) Business Park to be used as its corporate headquarters.

Computer Automation, Inc. has more than doubled its operating space with the completion of an 81,000 sq-ft facility at 2181 Dupont Drive, Irvine, Calif.

Magnetic Peripherals, Inc. has expanded its production operations with the addition of a 40,000 sq-ft Aberdeen, S. Dakota plant.

Unitrode Corp. has begun operations in its 10,000 sq-ft production facility in San Diego.

National Data Corp. of Atlanta has established a branch at 17921 Sky Park Circle in the Airport Industrial Complex at Irvine, Calif.

Compu-Serv Network, Inc. has begun building a \$1.2 million computer center near Dublin, Ohio.

Linolex Systems, Inc. has moved its manufacturing and product development facilities to Bedford, Mass.

San Francisco Bay Area Openings for Systems Analysts Programmer/Analysts Programmers

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- **YOU SHOULD HAVE** college level training in engineering, business, computer science, mathematics or related disciplines, with one to 10 years experience in development or maintenance of applications in the functional areas noted above in PL/1, FORTRAN, or COBOL. Other useful qualifications include experience with IMS, RAMIS, MARK IV.

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Small Business Mart Seen Growing Abroad

LONDON — The installed base of small business systems in Europe is imposing, but the most impressive growth is in annual shipment figures, according to *EDP/Europa Report* (EDP/ER).

"With the lines of demarcation between the [small business system] and systems larger and smaller becoming hazier each year, the [small business system] is one of the most pervasive influences in the computer world," EDP/ER said, but noted that defining a small business system is all but impossible except by example.

International Data Corp. divides the market into three segments: the low-cost mini-computers-based systems costing \$20,000 or less (NCR 399, Nixdorf 820, Digital Equipment Corp. 300); the middle range with prices between \$20,000 and \$50,000 (IBM System 32, NCR Century 8200, Honeywell Information Systems Level 61, DEC Datasystem 500); and the top end with prices up to \$150,000, which could include some general-purpose systems such as the Burroughs B1700, International Computers Ltd. 2903 and Univac 90/30.

EDP/ER projected the installed base in Europe will grow from \$6 billion at year-end 1976 to about \$14 billion by the end of 1980, when annual shipments will reach \$3.5 billion.

"Over this period it is also expected that the price of the smaller units will continue to fall as a result of the influence of microprocessor technology [and] medium-priced units will increase in price as the complexity of the [small business system] increases. At the larger end of the scale, the

most important factor [is] the cost of the software for systems and applications.

The report noted that the most important difference between the European and the U.S. markets is the importance of independents in Europe, most of whom have developed from the traditional office equipment markets, according to the newsletter.

International News

In terms of market share by value, IBM tends to dominate in the larger systems area except in France, where CII/Honeywell Bull holds 38% of the market compared with IBM's 36%, and in the UK where ICL/Singer has 30% of the market compared with IBM's 25% and Burroughs' 20%.

The giant, however, commands 50% of the German market, according to EDP/ER figures.

In the small arena, the market shares are much more evenly spread. In Germany, for instance, Nixdorf has 30%, Kienzle 20%, Philips 15% and Olivetti 12%.

Philips claims 20% of the French smaller system market, while Kienzle and Nixdorf each have 15%, Olivetti 12% and Burroughs and Logabax each 10%.

Burroughs dominates the UK market with 40% followed by NCR with 20% and Olivetti and Logabax with 10% each, EDP/ER said.

"It will be seen that the situation at the moment is open, even IBM's dominance is only relative and there would appear to be a chance for all," EDP/ER stated.

Soviets Start Building New Generation CPU

YEREVAN, Soviet Armenia — The Soviets have begun batch production of the Nairi-4, a fourth-generation computer, at the Elektron plant here, according to the Novosti Press Agency in Moscow.

"Its productivity is 500,000 operations per second and it has an internal storage capacity of 64,000 alphanumeric symbols," Novosti stated.

The Nairi series of computers, designed by the Yerevan Research Institute of Mathematical Machines, are used throughout the USSR and other countries, the agency said. They are small multipurpose machines used for financial, design and research applications, it noted.

The Nairi-4 differs from previous models in that "for the first time a model in which the principle of nanoprogramming is employed has been designed in the USSR," according to a Novosti release.

"It ensures the interpretation of a system of microcommands and the unification of the means of control.

"Because of the use of so-called microbrackets, the size of the machine was reduced and its reliability was enhanced. The structural possibilities and technical parameters of the computer make it possible to tune it to the solution of various concrete problems," Novosti stated.

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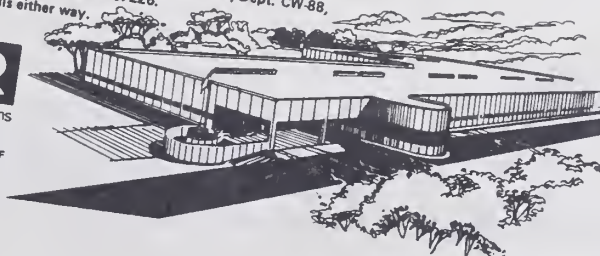
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A special report on *Minicomputers and Small Systems* in the August 29th *Computerworld*.

Minis are now functioning at every level of business and industry, and *Computerworld's* August 29th special report, edited by Esther Surden, will focus on several issues that are currently the subject of widespread discussion and debate in the minicomputer field. We'll also cover minicomputer hardware in depth — including microcomputers being used in data processing systems. In all, you'll see a variety of applications stories and tutorials on topics like these:

- Programming languages for small business systems — commentary on languages that have the same name but because of the "improvements" added by competing vendors, may have wide variances in operating efficiency.
- How to evaluate technical evaluations — a look at what benchmark tests and product specifications mean.
- The evaluation and selection process — a case study.
- Minicomputer maintenance — analysis of possible methods (vendor maintenance, independent service organizations, and end user self-support) with an eye to cost savings.
- Minicomputers in distributed processing — stand alone and communicating.
- Using minicomputer equipment — including general purpose minis, small business systems, turnkey systems, miniperipherals and microcomputers.

If you're interested in finding new ways to make data processing more useful and cost effective throughout your organization, you should read our special report in our August 29th issue. And if you're a mini manufacturer, OEM or systems house who's interested in telling potential customers how your equipment can help them in their jobs — advertise here. Your *Computerworld* salesman can give you complete details. But don't miss the August 12th ad closing date. Call Terry Williams at (617) 965-5800 to reserve space for your ad.



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Contracts

Electronic Memories & Magnetics Corp. has been awarded a fiscal contract by the U.S. General Services Administration for 360/30 and 360/50 add-on memory.

Optimum Systems, Inc. has received a contract from Arkansas Blue Cross and Blue Shield for DP and support services.

The Western Union Telegraph Co.'s Government Systems Division has been awarded a contract by the U.S. Army Electronics Command. The contract will provide a digital data communications system consolidating high-speed data and secure voice requirements of various U.S. government and intelligence agencies.

Metromation International, Inc. has been awarded a contract by Shell Canada Ltd. to furnish Shell's Chemical complex at Sarnia, Ont., with a computer-based process control system.

Kokusai Denshin Denwa Co. of Tokyo has been awarded a contract by the International Telecommunications Satellite Organization (Intelsat) for the collection of rain attenuation propagation data at 11.6 GHz.

Wyle Laboratories has been awarded a contract by the National Aeronautics and Space Administration's Langley Research Center for instrument support services.

Keane Associates, Inc. has been awarded a contract by the New England Power Exchange to develop an automated billing system.

National Data Corp. and Atlantic Richfield Co. have signed a credit card facilities management services contract.

Raytheon Service Co. has received contracts from Management Reports, Inc. of Cleveland, Mayflower Farms of Portland, Ore., and Watts Regulator Co. of Lawrence, Mass., for computer maintenance and field service.

POSITION ANNOUNCEMENTS

HOSPITAL INFORMATION SYSTEM

Allentown and Sacred Heart Computer Center, shared non-profit organization serving four hospitals, is seeking candidates for the following positions:

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For above positions, send resume, including salary history, in confidence (specifying job of interest), to Joy Loomis, DATA TERMINAL SYSTEMS, 155 Great Road, Stow, Mass. 01775



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EXON Enterprises Inc.

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Computer Services

SYSTEMS ENGINEERS

We have openings in the Washington, D.C. district, Richmond, Virginia, Hartford, Conn., and New York city Areas.

Sycor, Incorporated, a leading manufacturer of distributed data processing systems, is currently seeking qualified Systems Engineers.

Experience as a Programmer in COBOL or Assembler required. Micro/Mini and/or programmable (intelligent) terminal use or support experience desirable, plus exposure to data entry applications and marketing customer support. Communications with bi-sync and on-line background especially helpful. Bachelor's degree desired.

An excellent "fast-track" position for the right person! Send resume and salary history to:

GOPI R. JINDAL, Ph.D., Manager
Corporate Employment & Staffing

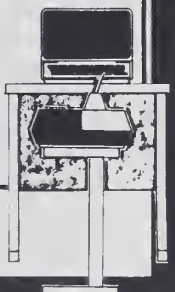
Sycor, Inc.

100 Phoenix Drive
Ann Arbor, Michigan 48104
(313) 995-1156

As an Equal Opportunity and Affirmative Action Employer, Sycor, Inc., Urges Females and Members of Minority Groups to Apply.

Sycor, Inc.

An Intelligent Idea



Yours Free!



Call for your copy today!

Source Edp's 1977 Computer Salary Survey is now available. This authoritative and up-to-the-minute report will allow you to compare your compensation directly with professionals across the country performing the same duties you perform. It also examines in detail the strategies and techniques thousands of successful computer professionals have used to enhance their careers. After fifteen years of recruiting experience, Source Edp knows how you can gain broader professional exposure, maximize your compensation and break into management. It's all in Source Edp's 1977 Computer Salary Survey and career planning guide.

For your FREE copy, call the Source Edp office nearest you.

East		South/Southwest	
Boston	617/482-7613	Atlanta	404/325-8370
Greenwich	203/869-5977	Dallas	214/387-1600
Hartford	203/522-6590	Denver	303/773-3700
New York	212/736-7445	Fort Worth	817/338-9300
Philadelphia	215/665-1717	Houston	713/626-8705
Union, N.J.	201/687-8700	New Orleans	504/561-6000
Wash., D.C.	703/790-5610		
Wellesley, Ma.	617/237-3120		
Midwest		West Coast	
Chicago	312/782-0857	Encino, Ca.	213/995-8866
Oak Brook, Il.	312/986-0422	Irvine, Ca.	714/833-1730
Cleveland	216/771-2070	Los Angeles	213/386-5500
Detroit	313/352-6520	Oakland	415/444-5955
Kansas City, Mo.	816/474-3393	Palo Alto	415/328-7155
Minneapolis	612/544-3600	San Francisco	415/434-2410
St. Louis	314/862-3800	Seattle	206/454-6400
St. Paul	612/771-0544	Torrance, Ca.	213/540-7500

source  edp

(When writing, please be sure to indicate home address and current position title.)

If unable to call, write:
Source Edp
Department C28
721 Enterprise
Oak Brook, Illinois 60521

Advanced Software Design

Applications/Systems/Data Base Design

Telecommunications is one of the most rapidly growing segments of the software frontier. We have major projects underway now... forerunners of our long-term commitment to significantly advancing the state-of-the-art. We're working from definition and design through development and implementation in areas such as CAD, Data Base Systems, Simulation, Fault Recovery, Diagnostics and many areas of software design in an on-line, real-time environment.

Software Design Engineers

We're looking for an indepth background in the development of systems software and a minimum of 3 years' experience in structured design, testing and documentation of programs running on large data base, multi-file systems in real-time. Familiarity with HIPO design documentation, TSO usage and software simulation techniques as well as PL1, Fortran and assembler languages for the 8080 and PDP 11 programming is also important.

Data Base Design

You will need a minimum of 5 years' experience in the planning, development, design and implementation of data base software, including data base management systems administration. Your primary responsibilities will be the development of data base system for a large on-going project including the implementation, support and administration of systems.

Computer Aided Design

We are looking for an extensive background in the design of CAD/CAM systems and the development of Interactive access by the users of CAD/CAM functions. Required is 5-10 years' experience in both hardware and software aspects; DA systems operations, and design, and systems engineering. Your initial responsibilities will include evaluation of existing systems, and working with a project team in the Architectural Planning of a major new system.

Mini-Computer Programmers

We have specific assignments available on project development teams responsible for the design implementation of various telecommunication processing systems utilizing mini-computers as the processing element. Responsibilities will include the development of software programs for real-time operating systems as well as unique hardware elements incorporated into the systems.

If you have in-depth expertise in one or more of these areas, a BS, MS or PhD in Electrical Engineering, Computer Science, Math or other appropriate engineering discipline and have an interest in moving forward with one of the challenging new frontiers in computer technology, talk with us.

CALL TOLL FREE

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In Illinois (800) 942-0491

Today thru Friday from 8 am to 5 pm cst

**If unable to call, please send your resume to:
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SOFTWARE



We need more pros for our team

Right now. Today. We've got challenging jobs for computer software engineers with experience in:

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- Utilities
- Networks/Data Comm.
- Diagnostics
- Compilers
- Software QA

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Join the team that's growing faster than the industry average of 35 percent. Interdata, where you can make it happen.

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SYSTEMS ANALYST (Manufacturing Systems/Wholesale Distribution)

Are you looking for responsibility? Do you want a challenge? If so, act now.

We are seeking individuals to develop Wholesale Distribution Systems or Manufacturing Systems design for sales worldwide.

MANUFACTURING SYSTEMS

Our Manufacturing Systems Analysts will work with the systems development organization using data base structure techniques and provide systems support for manufacturing applications and related operating software.

Individuals should have a thorough understanding of manufacturing systems in an interactive or on-line environment with at least 3-4 years data processing techniques in a manufacturing environment.

WHOLESALE DISTRIBUTION

Our Wholesale Systems Analysts will work with a systems development organization employing the latest systems developing techniques and provide systems support for wholesale/distribution applications and related operating software.

Individuals should have an understanding of "HIPO" and/or other structured design and programming techniques with at least 3-4 years experience with data processing techniques in a wholesale environment.

Candidates for these positions should possess a BSCS, technical related degree or equivalent work related experience.

Let us hear from you! We will give you a quick reply. Send your resume with salary history to:

NCR

Mr. Max Anderson
Corporate Executive &
Professional Recruitment
NCR Corporation
Dayton, Ohio 45479

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Scientific Computing Consultant

Our Corporate Computing Center has an opening for a scientific computing consultant. Major responsibilities will consist of providing programming and debugging assistance to scientific computer users, conducting seminars and short courses in FORTRAN, JCL and other programming subjects. Other duties will include writing user documentation and participating in software product evaluation and software quality assurance testing.

A Bachelor's degree in mathematics, computer science or in a related scientific field is mandatory. Experience in scientific programming with extensive knowledge of FORTRAN and OS or VS JCL, teaching experience, good communication skills, and an ability to work well with people are essential.

Qualified applicants should send their resume to: Ground Systems Group, Dept. B, P.O. Box 3310, Fullerton, CA 92634.

HUGHES

HUGHES AIRCRAFT COMPANY

U.S. CITIZENSHIP REQUIRED

Equal Opportunity M/F/MC Employer

Systems Manager

Reports to Division President. Responsible for planning, designing, implementing, executing and controlling all systems. Supervises the data process function, coordinates operations with sister division in telecommunications environment and recommends the acquisition and justification of data processing equipment.

REQUIREMENTS:

Manufacturing environment. Strong systems development in areas of:

- MRP, cost system, order entry, shop floor control, production planning, standard financial systems, inventory control.
- Supervisory experience of data processing operations.

HARDWARE-Systems 3, systems 360 MOD 30

LANGUAGES-RPG, RPG II

SOFTWARE-DBOMP, CICS

EDUCATION:

Business Administration, Computer Science, Industrial Management.

Send resume in confidence including salary history and requirements to: Personnel Manager

Simmonds Precision
Motion Controls, Inc.

197 Ridgedale Ave

Cedar Knolls, N.J. 07927

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SENIOR SOFTWARE MANAGEMENT

Very attractive positions for those having experience in DESIGN, DEVELOPMENT & APPLICATION of real-time software systems.

Must also have experience in directing major software development projects and supervising design personnel. A technical degree and ability to work effectively with non-software managers necessary.

Pleasant medium sized midwest city. Send your resume or letter of interest in complete confidence to CW Box 5723, 797 Washington St., Newton, Mass. 02160.

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Policy No. 14U/Upgrading for DATA PROCESSING Expansion

Career Assurance for:

SYSTEMS & PROGRAMMER ANALYSTS

with insurance experience

with strong analysis background

Program

Our special upgrading and system expansion will offer Data Processing professionals a unique opportunity to work with some of the most sophisticated equipment in our industry. Current opportunities exist with our **PROPERTY/CASUALTY UNIT** for individuals with actuarial or statistical experience coupled with exposure in personal and commercial lines. Knowledge of information systems is a plus, but not essential. Additionally, excellent openings exist with our **GROUP INSURANCE DEPARTMENT** for ambitious individuals possessing a life/group insurance background.

Terms

The above positions with our **PROPERTY/CASUALTY** and **GROUP INSURANCE DEPARTMENTS** will involve the analysis and design of new information systems. Applicants should possess experience in the design and installation of insurance systems.

Premiums

Qualified applicants will work in our new modern data processing center (cited by ABC News). Additionally, Hartford is ideally located in New England, offering four-seasons of recreational and cultural resources. Here, you'll find the quality of life equal to your expectations.

Dividends

The Hartford's continuous training programs will increase the scope of your EDP capabilities, pointing the way to senior systems analysis and supervisory and management positions. These openings in our **PROPERTY/CASUALTY** and **GROUP INSURANCE DEPARTMENTS** represent genuine challenges, advancement opportunity, a solid benefits package that includes a dental plan, and an incentive savings program.

Representative

Paul F. Meissner, Jr., Recruiter
The Hartford Insurance Group
Hartford Plaza, Hartford, CT 06115
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THE HARTFORD

Computer Software Engineers

If you've just realized you're working on problems any engineer can solve, you're probably not just any engineer.

You're probably talented, creative, and ready for a step up to Kearsfott. We have a long history of providing complex hardware/software problems that demand a great deal more thinking than the usual assignment.

And there's more than a good chance we have a place for you on advanced projects in the guidance, navigation and control field — where you'll apply computer technology to one or more of the following:

- Avionic systems simulation
- Realtime control of navigation and communications systems
- Automatic testing of avionic subsystems
- Airborne computer products

You should be a computer software specialist with a degree in Engineering or Physics, at least 2 years' experience, and have the ability to communicate effectively with hardware professionals. We offer on-site **MASTERS DEGREE** programs in Computer Science and Systems Science . . . plus commensurate salary, comprehensive benefits, and solid opportunity to keep growing right along with your contributions. Apply now by sending your resume with salary history in strict confidence to: **Mr. J. DeGennaro, Singer Co., 1150 McBride Avenue, Little Falls, New Jersey 07424.**

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NCR

NCR Corporation

Communication Systems Division

THIS IS OUR RESUME:

Location:

Columbia, South Carolina, offering a lifestyle of both city and country living with excellent recreational facilities for tennis, golf, fishing, and water sports. The area also offers excellent housing opportunities, low taxes and is the home of the University of South Carolina.

Professional Objective:

To develop and implement data communications products and supporting software along with providing a home for the on-line data communications specialist.

Experience and Summary of Qualifications:

10/74-Present: Rapidly expanding 3-year-old commercial division employing 460 people in a state-of-the-art environment developing communications controllers, microprocessors, semiconductor memory modules, and their application to terminals and data processing systems.

References:

Knowledgeable professionals in the data communications and microprocessor industry.

NOW THAT YOU HAVE SEEN OUR RESUME, WE WOULD LIKE TO SEE YOURS ...

We are currently seeking qualified personnel with experience in any one of the following areas:

DESIGN ENGINEERS

- Processor design using MOS or bipolar bit slice devices
- Microprogramming
- Microcomputer diagnostic software
- State-of-the-art semiconductor memory design
- A/D to D/A conversion design
- Linear and digital circuit design

COMPONENT ENGINEERS

- Experience in memories and microprocessors
- Knowledge of characterization and qualifications requirements of LSI

MODEM ENGINEERS

- 1200 to 9600 BPS
- Design, application, evaluation, and production support
- Microcomputer systems

PROGRAMMERS AND SYSTEMS ANALYSTS*(Hardware/Software)*

Openings exist in the following technical areas:

- Distributed network architecture
- Systems design
- Simulations
- Operating systems
- Real time systems
- Diagnostics and error recovery
- SDLC, asynch, bisynch disciplines
- Assembly language experience

If you are seeking a challenging career with a leader in the industry, require a change in your lifestyle and have the above experience, we would like to speak to you. A degree in engineering, math or computer science required. Recent graduates will also be given consideration. For immediate response, please send your resume with salary requirements in complete confidence to:

NCR

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Mr. Ken Uhlig
Communication Systems Division
NCR Corporation
3325 Platt Springs Road
West Columbia, S.C. 29169

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CSC**PROGRAMMER/ANALYSTS**

**AT CSC's SYSTEM SCIENCES DIVISION,
YOUR OPTIONS ARE GREATER**

Computer Sciences Corporation is a world leader in information sciences with more than 8,000 people working on governmental, commercial, and industrial projects.

CSC's System Sciences Division is creating more positions to meet project demands, offering you professional challenges and career choices commensurate with your ability.

Currently, we are expanding two projects: Our FAA assignment is to develop and implement air traffic control systems; and our NASA program supports three major projects. Professionals of all levels of experience are welcome to investigate opportunities now available in our organization.

**AIR TRAFFIC
CONTROL SYSTEMS**

We are seeking experience on IBM 360/OS in any one of the following areas:

Simulation of air traffic patterns. Knowledge of JOVIAL a plus.

Design and implementation of data base management systems

OS/360 System generation and maintenance

Diagnostic design, development or enhancement and hardware orientation

Software test and validation including development of tools to test and validate real-time software systems.

Software Quality Assurance

BAL and/or high level language (preferably JOVIAL) experience highly desirable.

Positions are located in Jacksonville, Florida.

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SCIENCES**

Current positions in support of our Goddard Real-Time System, Space Tracking Data Network and On/Off Site Project for the NASA Goddard Space Flight Center require a degree in Computer Science, Math, Physics, Astronomy, Meteorology or Engineering with experience using FORTRAN and/or Assembly languages on large-scale or mini-computers. These skills will be applied in the following concentrations:

- Telemetry application with multi-computer configuration
- Integration and testing of real-time display software
- Data base management
- Real-time scientific applications
- Network management
- Computer-to-computer communications
- System requirements definition
- Analysis and application of climatological data
- Simulation/modeling of real-time systems

CSC offers a liberal relocation policy in addition to a complete benefits package. For immediate consideration please send resume or call:

Staffing Department

Toll Free: 800-638-0842 Or Call Collect: (301) 589-1545

**COMPUTER SCIENCES
CORPORATION**

System Sciences Division
8728 Colesville Road
Silver Spring, Maryland 20910

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**SENIOR
PROGRAMMER
ANALYST**

More than a century old Wall Street financial firm with a proud tradition of growth offers opportunity for a progressive career in a sophisticated professional EDP environment geared toward advanced applications. We are a "state-of-the-art" 370/158 VS installation supporting IMS and CICS in our environment.

Our requirements:

- Heavy BAL experience
- Strong JCL experience in OS environment
- CICS or IMS application experience
- Degree required, preferably in a quantitative discipline

We offer an excellent salary and benefits program enhanced by solid growth potential. For prompt and confidential consideration send resume, which must include salary history and requirements to: Charles D. Noble, Personnel Department, U.S. Trust Company of New York, 130 John Street, New York N.Y. 10038

U.S. Trust Co. of N.Y.

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**SOFTWARE
IMPLEMENTATION
SPECIALIST**

As a recognized leader in computer aided manufacturing systems, we are offering a unique and challenging opportunity for a results oriented professional. The individual in this position will provide liaison between customers and corporate personnel and be ultimately responsible for the coordination and implementation of software systems.

Qualifications and requirements are as follows:

- A college degree in Computer Science, Mathematics, Engineering, or Business.
- Familiarity with IBM 360/370 systems including JCL, and the conversion of JCL from one system to another.
- Knowledge of I/O file organization/structure and access methods.
- Programming experience, preferably in FORTRAN.
- Strong interpersonal skills.
- Ability to work independently.
- Ability to travel extensively.

If you meet these qualifications and seek an excellent career opportunity, send resume and salary requirements in complete confidence to:

Manufacturing Data Systems, Inc.
4251 Plymouth Road
Ann Arbor, Michigan 48105
Attention: Personnel
An Equal Opportunity Employer

**SENIOR APPLICATIONS
PROGRAMMERS**

Dun & Bradstreet, Inc., has a 14 year history of excellence and growth in providing services to the business community. Annual volume exceeds \$1/2 Billion.

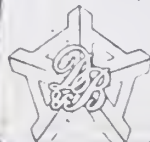
As a senior applications programmer in our Systems Research and Development department, you'll develop long range projects as well as enhance existing systems. Your work will give you valuable exposure to all of the latest data processing trends: distributed processing; data base, batch, on-line, and real-time software applications.

Our location is most desirable. Semi-rural Berkeley Heights, N.J. is just 20 miles from Manhattan.

The successful candidate should have 3-5 years FORTRAN and ASSEMBLER language experience on large scale and/or mini-computers.

Dun & Bradstreet offers excellent career prospects in a growth environment, competitive starting salaries, and liberal benefits.

Please send your resume including your salary progression, in confidence, to:



Peter Spiro
Director Project Administration
DUN & BRADSTREET, INC.
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Berkeley Heights, N.J. 07922
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SUNBELT OPPORTUNITIES

Sr. Analyst \$20K +
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PROGRAMMER**

IBM/DOS tech. bkgd. qualifies for Htd area opening. Indiv will direct all tech planning and installation. Salary to \$20,000. Contact Stan Durbas for details.

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**computer hardware
and
software candidates...**

RELAX

We have scores of openings in all parts of the U.S. Our fees are paid by hiring companies anxious to find qualified computer hardware and software candidates. Contact the nearest office for confidential service and let us do the footwork.

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(813) 872-2631

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Dorothy Spiegel DP Specialist
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Portland, Oregon 97205
(503) 224-6860

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Minneapolis, MN 55416
(612) 927-4653

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Memphis, Tenn. 38117
(901) 767-5150

COMPUTER CAREERS INC.
Specialists-Data Processing
4720 Montgomery Lane
Suite 503
Bethesda, MD. 20014
(301) 654-9225

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(201) 335-8700

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Knowledge of the following computers is desirable:

- **MINI-COMPUTERS:** ModComp IV, CAI/LSI-2, PDP-11
- **LARGE COMPUTERS:** B-6700, IBM 370, H-6000

Top salaries, fully-paid fringes including life, health and dental insurances, moving allowance and educational benefits. To arrange an interview, call or send your resume to Ms. Norma Mitchell.

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(313) 326-7010

communications software development

SAN FRANCISCO PENINSULA

Intel Corporation, the world leader in microprocessor technology, is seeking experienced software professionals for our data communications group. This is your opportunity to play a key role in the design and development of sophisticated multi-processor-based communications systems.

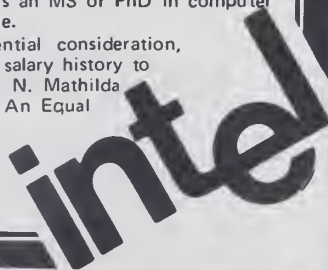
You will work closely with hardware development and use the latest microprocessor components and peripherals. To qualify, you should have experience in one or more of these areas:

- Data communications and networks
- Real-time operating systems and modern operating system design theory
- VTAM, TCAM, BTAM, etc.

Experience with high-level system implementation languages and the design of operating systems and systems software for micro- or mini-computers plus an MS or PhD in computer science or related field desirable.

For immediate and confidential consideration, please send your resume with salary history to Intel Memory Systems, 1302 N. Mathilda Ave., Sunnyvale, CA 94086. An Equal Opportunity Employer M/F.

MEMORY
SYSTEMS



Programmers

NCR's Terminal Systems Division in Millsboro, Delaware has unparalleled career opportunities for individuals interested in advancing state-of-the-art in POS terminals.

SYSTEMS PROGRAMMER ENGINEER

- Experience with DEC PDP 11/35 or higher level computers required.
- Requires a background in minicomputer or microprocessor systems and/or associated application programming.

SYSTEMS I/O - F/W PROGRAMMER

- Requires experience in general purpose applications minicomputer programming of peripheral devices, at the assembler level.
- Responsibilities will include the definition and supervision of coding of applications oriented F/W to interface POS terminal peripherals to the base ECR.

COMMUNICATIONS F/W PROGRAMMER

- Requires experience in data communications minicomputer programming at the assembler level.
- Experience with RJE-type communications and synchronous protocols preferred. Knowledge of SDLC fundamentals a plus.

DIAGNOSTIC ENGINEER/ PROGRAMMER

- Requires an engineer or hardware-minded programmer with minicomputer programming experience and a flair for the challenge of diagnostic test software.

All positions require a BS in EE, CS, Math or related discipline.

In addition to an unparalleled career opportunity within NCR, our Millsboro location offers comfortable living in a scenic and uncongested coastal area. The finest marine recreational areas, wildlife preserves, and beaches are within minutes of our Millsboro facility.

If success interests you, please send your resume to:



Mr. Ron Tull, Dept. CW-88
Terminal Systems Div.-Millsboro
NCR Corporation
P.O. Box 607
Millsboro, Delaware 19966

An Equal Opportunity Employer

COMPUTER PROGRAMMER

Immediate opening — position requires original programming and program maintenance for an ongoing complex system of Library applications in both teleprocessing and batch environments. Library cataloging, circulation and processing of textual information is involved.

Must be a graduate of a recognized data processing or computer science program and be competent in Cobol and PL/I. Experience in IBM 360 or 370 Assembler Language highly desirable.

For confidential attention, please send resume to:

Director of Personnel
Western Kentucky University
Bowling Green, KY 42101
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Staff Operations Analyst 20K
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Sr. Prog. Analyst 18K
Minimum 2 years OS, JCL and Systems Design
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Group Ins. knowledge with OS exp. to assist in design of Group Systems
Group Systems Specialist 15K
Knowledge of APL and strong in Math

PARKER PAGE ASSOCIATES

P.O. Box 12308
Seattle, WA 98111
Offices: Seattle, Wash., D.C.,
Michigan, Atlanta

COMPUTER PROFESSIONALS MVS JES-3 CICS

Our continued strong commitment to the development and installation of sophisticated financial applications and software techniques creates a number of positions which are available in our information services department. We are searching for those computer professionals who desire to join a team which will remain leaders in our industry.

PROJECT MANAGERS

Individuals will be responsible for the overall direction of the various disciplines required in the design and implementation of financial and business systems. Involvement with design of EDP systems and project management of at least 5 years is required. Formal training in computer science an advantage and may be substituted for some of the experience requirements.

SENIOR PROGRAMMER ANALYSTS

ANS COBOL experience of at least three to five years in a business or financial environment is essential. We desire familiarity with: DBMS, DB/DC, CICS, ALC or file access methods. Experience with hierarchical design will be helpful. Will be assigned to complex projects of design and implementation. Excellent communication skills necessary because of heavy user contact.

PROGRAMMER ANALYSTS

Requires fluency in COBOL and background including IBM 370 using MVS and OS/JCL. These individuals must have a system background of at least two to three years. Also must be capable of involved and complex system and program design. Excellent communications skills important. On-line program development experience a plus.

These are positions which will require individuals who are willing to accept unusual challenge and responsibility. We offer involvement in one of the most progressive sites in the industry. Compensation will be commensurate with background. We offer competitive benefits and a very desirable Western New York location. Please send resume including salary history and requirements to: Robert J. Woepel, Manager - Employment, Marine Midland Bank, One Marine Midland Center, Buffalo, New York 14240.



MARINE MIDLAND BANK
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Programmers, is your employer occasionally . . . disagreeable?

Does your boss have an unpleasant way of implanting his ideas in your mind?

The enlightened employer knows that his best interests are best served by caring about your best interests. There are plenty of excellent employers around . . . good people who will help you in your career development . . . and they really need you now like never before.

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 **NATIONAL
COMPUTER ASSOCIATES**

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386 North York Street
Einhurst, Illinois 60126

DALLAS
Data Processing Careers, Inc.
Suite 1109
Stemmons Tower West
Dallas, Texas 75207

DETROIT
Electronic Systems Personnel
Prudential Town Center
3000 Town Center, Suite 2580
Southfield, Michigan 48075

FLORIDA
Data Sciences Personnel, Inc.
Suite 205, 15490 N.W. 7th Ave.
Miami, Florida 33169

HARTFORD
Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105

LOS ANGELES
Constellation Enterprises
Suite 900, 3250 Wilshire Blvd.
Los Angeles, California 90010

MINNEAPOLIS/ST. PAUL
Electronic Systems Personnel
801 Nicollet Mall, Suite 1716
Minneapolis, Minnesota 55402

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405 Lexington Avenue
New York, New York 10017

NORTH CAROLINA
TaskForce, Inc.
1045 E. Wendover Ave.
P.O. Box 6888
Greensboro, N. Carolina 27405

PHILADELPHIA
Systems Personnel
207 Fox Lane
Wallingford, Pa 19086

PITTSBURGH
Electronic Systems Personnel
106 Lawyers Building
428 Forbes Avenue
Pittsburgh, Pennsylvania 15219

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The Computer Resources Group
Agency, Inc.
303 Sacramento Street
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(Agency)
2530 James Street
Syracuse, New York 13206

TULSA
Data Processing Careers, Inc.
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2626 East 21st Street
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ESP Systems Corporation
Suite 210
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We are looking for a hands-on engineer to perform reliability improvement studies on our computer systems and associated peripherals. Applicants should have a BSEE degree or equivalent and one to three years experience in design or reliability improvement programs.

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Primary responsibility will be evaluation of product line quality and directing corrective action. Must have a minimum of five years hands-on computer hardware experience and be capable of establishing acceptance standards for new products and processes. Must be motivated individual. A BSEE, Engineering or science degree is required.

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To design test equipment and generate test programs for data processing products. BSEE degree, or equivalent, with three or more years experience in digital design and assembly language programming.

These positions offer excellent salaries and benefits, the opportunity for rapid advancement, and a challenging work environment in a growth-oriented company. Send resume with full salary history to **Mr. Chuck Zeleny, Manager of Employee Relations, Dept. CW, Datapoint Corporation, 9725 Datapoint Drive, San Antonio, Texas 78284.**

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Large-Scale Opportunities in Advanced-Technology EDP Systems Development

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Several positions are currently available consisting of the development of a very large distributive processing system and will include advanced state-of-the-art technology. Will utilize the entire spectrum of EDP equipment from mini's to large mainframe and a large assortment of associated peripherals and other de-

vices, i.e. terminals, etc. Minimum of 5 years' experience in the development of systems software with the preponderance of this experience in telecommunications, networks and file processing, plus a background in operating systems, plus expertise in COBOL and assembly languages necessary with strong preference for a related degree.

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Positions are available in the development of a very large distributive processing system, advancing the state-of-the-art technology utilizing the spectrum of EDP equipment—minis to

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Immediate opening for Technical Director of Data Processing, based in Chicago. This position plans and supervises the activity of 15 to 20 employees in NORC's data processing departments in Chicago and New York. Specific duties include:

planning and evaluation of software for eventual importation or internal development; development and operation of data base entry and editing facilities; planning and decision-making in the area of proposal development and proposal writing; responsibility for Data Processing budgeting and budget management; interaction with operations and administrative staff of organization.

Requirements include: some post-BA education in computer science or a related field desirable; an MBA, MA, or equivalent ideal. Work experience with data processing, ability to design and evaluate software, and writing skills essential. Familiarity with IBM 370/OS and some exposure to on-line systems essential. FORTRAN essential, PL/1 desirable, and some exposure to Assembler language useful.

Salary range from \$18,000-\$25,000, depending on experience. Submit resume to:

Garth Taylor, Chairperson
DP Director, Search Committee
Nat'l. Opinion Research Center
6030 S. Ellis Avenue
Chicago, IL 60637
AAA/EOE

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Expanding major property and casualty insurance carrier seeks experienced programmers and programmer analysts with COBOL, IMS O/S background.

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Send your resume in complete confidence to W.D. Taylor, Harris Corporation, Computer Systems Division, 1200 Gateway Drive, Fort Lauderdale, Florida 33309.



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Experience in Mini/Micro computers with Assembler language is desired. BS in Computer Science or equivalent is a must. MS is preferred.

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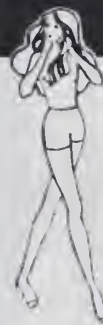
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Los Angeles County's Data Processing Department has career opportunities for programmers working on major teleprocessing applications for IBM 370-158's and Univac 1100-40's, using IMS and DMS 1100 data base management software. The Department has the largest Univac installation and one of the largest IBM installations west of the Mississippi. Systems development and maintenance opportunities include large scale on-line applications in health, welfare, law enforcement, fiscal and engineering.

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If you are qualified, send your resume with salary history, referencing this ad, in confidence to: Personnel Department, TYMSHARE INC. 20705 Valley Green Drive, Cupertino, California 95014. An equal opportunity employer m/f.



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Individuals should have 3 to 4 years experience in HASP, OS/MVT, VS1, VS2 and IMS. Will be responsible for maintenance of all operating system software and providing technological guidance to data processing staff. Experience in maintaining complex IMS environment is a necessity. Degree is required.

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Successful candidate must possess degree in math, computer science or related field and have 4 to 5 years experience with ANS COBOL. IMS experience would be helpful.

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